The Far Eastern Review

ENGINEERING + FINANCE + COMMERCE

A Monthly Review of Far Eastern Trade, Finance and Engineering, Dedicated to the Industrial Development and Advancement of Trade in Far Eastern Countries.

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CHINA

China (Chung Kuo) comprises China Proper (eighteen provinces), Manchuria, Mongolia, Sinkiang and Tibet.

Area and Population.—Accurate figures of area and population are impossible to secure. It is generally accepted that the total area is between 4,278,352 and 4,376,000 square miles. The area of China Proper—that is, the provinces of Chihli, Shantung, Shansi, Shensi, Honan, Kiangsu, Kiangsi, Anhwei, Chekiang, Fukien, Hupeh, Hunan, Kansu, Szechuan, Kuangtung, Kuangsi, Kweichow and Yunnan—is set down at 1,532,815 square miles. Its length from north to south is 1,860 miles, and its breadth 1,520 miles.

The estimated population of China Proper ranges from 271,770,000 (331,000,000 is the Mingchengpu census of 1910) to 407,253,029. The generally accepted figure is that of the Mingchengpu census. The total population for the whole of China is estimated at between 342.6 millions and 448,000,000.

The Foreign Population in 1918, according to Customs reports, was as follows: American, 5,766; Austrian, 271; Belgian, 360; Brazilian, 16; British, 7,953; Danish, 475; Dutch, 377; French (including 918 proteges), 2,580; German, 2,651; Hungarian, 7; Italian, 535; Japanese, 159,950; Norwegian, 279; Portuguese, 2,417; Russian, 59,719; Spanish, 298; Swedish, 530; Non-treaty Powers, 343; total, 244,527. The figures of German and Austrian population in 1918 were greatly reduced by repatriation in 1919.

Government.—The Government of the eighteen provinces is entrusted to civil and military Governors, and under them each province is subdivided into circuits superintended by Taoyins or intendants, and again into districts. All the territorial officials are appointed by the Central Government, and the Provincial Governors, though free to act independently in many matters of local detail and finance, are responsible to the Central Government at Peking in all important questions, and especially in foreign affairs.

The Army.—The total strength in all forces after the rebellion in 1913 was estimated at 600,000. As various commanders recruit to suit their own purposes no accurate figures are available, but at the end of 1917 it is probable that 800,000 men were under arms.

The Navy.—This arm of the defense is out of date. China possesses two protected cruisers built in 1911 (2,756 tons), four older protected cruisers (4,300-3,000 tons), three torpedo gunboats (850 tons), eleven gunboats (750-550 tons), four destroyers (400 tons), and eight small torpedo boats (120 tons.)

Currency.—The standard currency in China is silver, its unit being the Tael, which is not a coin but a weight, its value varying considerably. In 1882, in Shanghai, the tael was worth 5s. 2d.; in 1892 the Haikwan Tael (the official Customs Tael) was worth 4s. 4½d.; on 1907, 3s. 3d.; in 1917, 4s. 3 13/16: in 1918. 5s. 3 7/16. Various silver dollars circulate, as well as copper cents, while cash is greatly used among the poorer classes and country people. The cash should weigh one-tenth of a tael and have the value of 1,000 cash to a silver tael, but this standard is never maintained. In 1882 a Shanghai tael (5s. 2d.) was equal to 1,690 cash, and in 1902 when the tael was worth 2s. 7⅝d. it was equal to 1,240 cash.

Foreign Trade in China.—In 1918 the net value of foreign trade of China was the highest on record, the total being Hk. Tls. 1,040,776,113, an increase of Hk. Tls. 28,325,709 over that for 1917. Net imports of Hk. Tls. 554,893,082 compared with Hk. Tls. 549,518,774 in 1917; and exports of Hk. Tls. 485,883,031 compared with Hk. Tls. 462,931,630 in 1917.

Treaty Ports, Trading Ports, and Ports of Call.—There are forty-eight treaty ports in China, which are classified by the Chinese Maritime Customs as follows:

Northern Ports: Aigun, Sansing, Manchouli, Harbin, Suifenho, Hunchun, Lungchingtsun, Antung, Tatungkow, Dairen, Newchawng, Chinwangtao, Tientsin, Lungkow, Chefoo and Kiaochow.

Yangtse Ports: Chungking, Ichang, Shasi, Changsha, Yochow, Hankow, Kiukiang, Wuhu, Nanking and Chinkiang.

Central Ports: Shanghai, Soochow, Hangchow, Ningpo and Wenchow.

Southern Ports: Santuao, Foochow, Amoy, Swatow, Canton, Kowloon, Kongmoon, Samshui, Lappa, Wuchow, Nanning, Kiungchow and Pakhoi.

Frontier Ports: Lungchow, Mengtze, Szemao and Tengyueh.

Ports Opened to Trade are: In *Manchuria:* Mukden, Fakumen, Fenghwangcheng, Sinminfu, Teihling, Tungkiangtze, Yingkow (Newchwang), Liaoyang, Changchun, Kirin, Ninguta, Chuizuchien, Toutaokow, Tsitsihar, Hailar. In *Sinkiang:* Kashgar. In *Shantung:* Chow'sun, Tsinanfu, Weihaiwei, Weihsien. In *Kiangsu:* Woosung. In *Tibet:* Gartok and Gyangtze.

Ports of Call: For Passengers and Cargo: In *Kuangtung*—Kumchuk, Shuihsing, Pakto, Takhing, Lating, Dosing. In *Kiangsi*—Hankow. In *Anhwei*—Tatung, Anking. In *Hupeh*—Wusueh and Luk'kow.

For Passengers: In *Kiangsu*—Kiangyin, Icheng. In *Hupeh*—Hwangshihkang, Hwangchow. In *Kuangtung*—Fengtsun, Kaukong, Yutshing, Lukpa, Howlik, Loto, Maning, Yungyan, Kulo and Jungki.

Railways.—

Government railways in operation	3,793 miles
Concessioned railways in operation	1,847 „
Private railways in operation	150 „
Total railways in operation	5,790 miles

Government railways under construction are about 330 miles.

Weights and Measures.—1 TAEL (*Liang*)—583.3 grains (1⅓-oz. avoirdupois) =37.783 grams.

16 Taels—1 CATTY (*Chin*)—1⅓-lb. avoirdupois—604.53 grams.

100 Catties—1 PICUL (*Tan*)—133⅓-lb. avoirdupois—60.453 kilograms=147.67 Russian pounds.

Length: 1 Chih—14.1 inches or 0.358 metres.

1 Li—*about one-third of a mile (or theoretically 2,115 feet, or two-fifths of* a mile).

Area: 1 Mow (Shanghai)=one-sixth of an English acre.

Capacity: 1 Tow (for tribute)=629 cubic inches (10.31 liters).

River.—The Yangtze-kiang is 3,200 miles in length. It rises in Tibet and drains some three-quarters of a million square miles of country. It is navigable for large steamers to Hankow (600 miles from the sea), for slightly smaller vessels to Ichang (1,000 miles), for small steamers and steam-launches for 300 miles farther, and for junks for 200 miles farther; or a total distance of half its length is available for the transport of merchandise. The river was opened to foreign trade by the Treaty of Tientsin (1858).

The Yellow River, or Huang-ho, rises about 100 miles from the source of the Yangtze. It is from 2,500 to 2,700 miles long, but is navigable only by junks, the vast quantities of silt carried by it and deposited in its channel rendering steam navigation impossible.

The Sikiang, or West River, rises in Yunnan and reaches the sea by several months near Canton. Its length is about 1,000 miles. Steamers go as far as Wuchow, some 220 miles from Canton and launches some 200 miles farther. Junks navigate it to near its source.

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Vol. XVI. JUNE, 1920 No. 6

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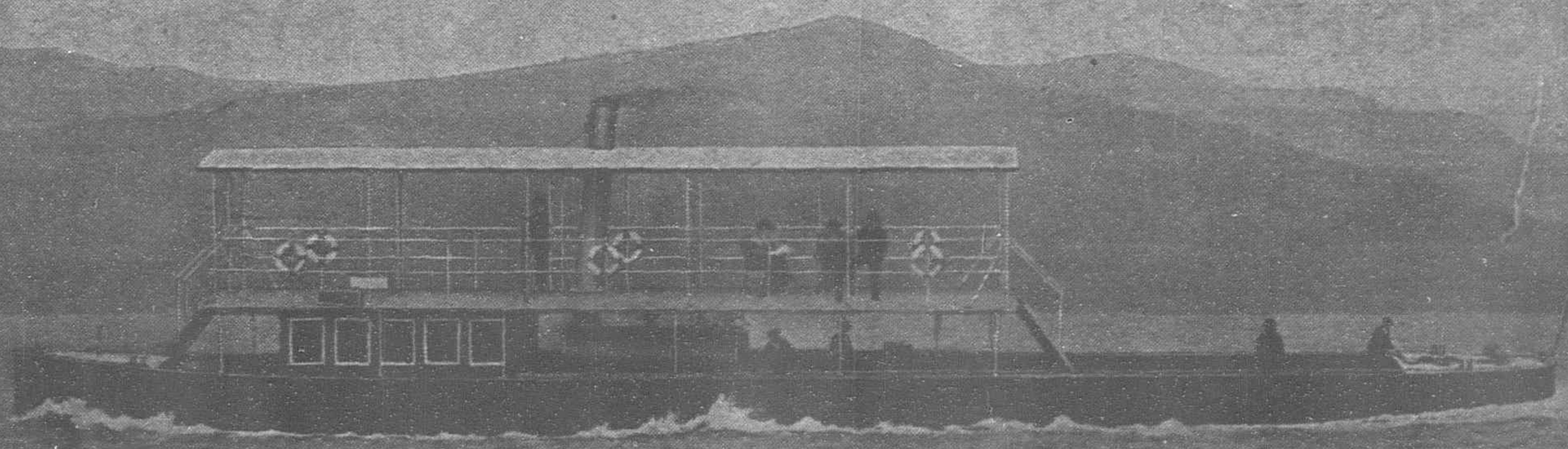

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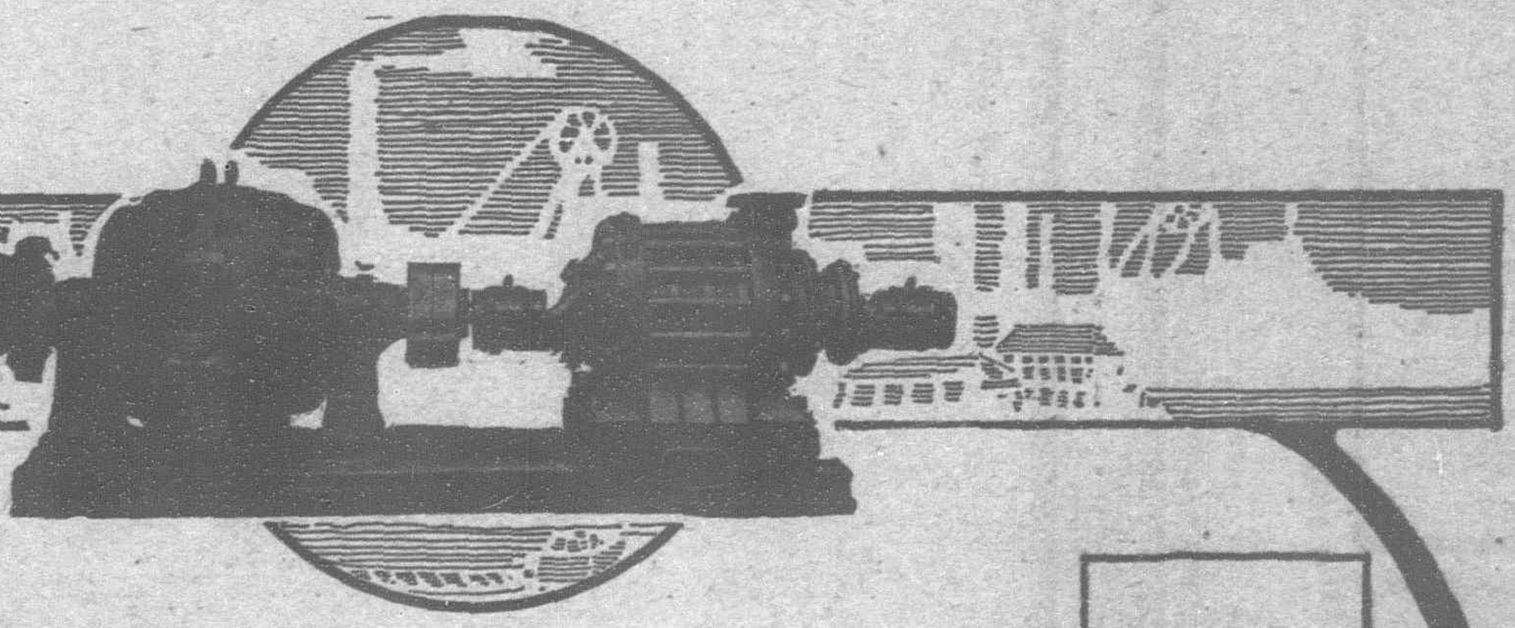

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The Far Eastern Review

ENGINEERING FINANCE COMMERCE

VOL. XVI SHANGHAI, JUNE, 1920 No. 6

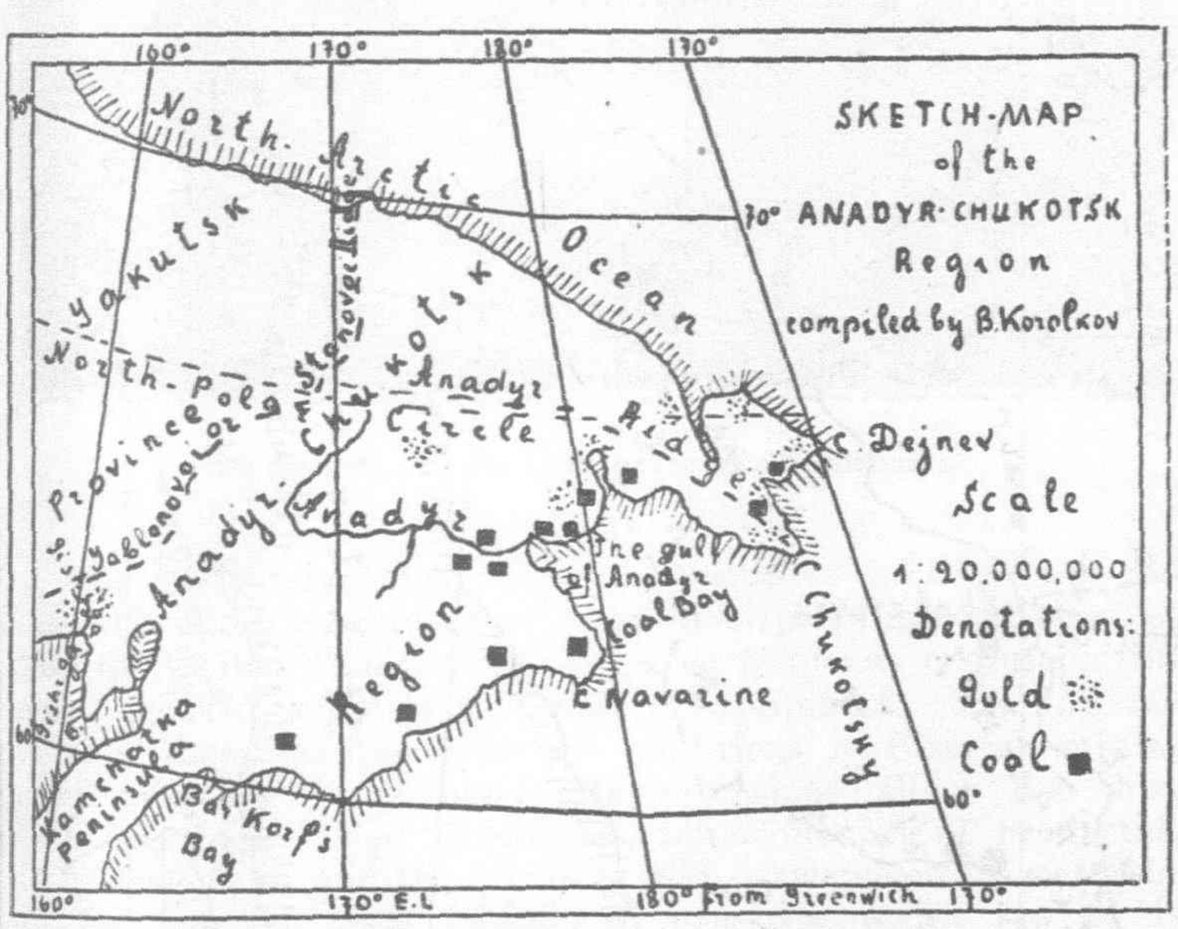
Mines and Mining in Siberia

A Summary of Mineral Deposits and their Present State of Development

By P. Polevoi, Mining Engineer

Translated from the Russian for the "Far Eastern Review" by B. Korolkov, Mining Engineer

THE area of the "Russian Far East," as Siberia is officially known, is 934,465 square miles of which scarcely the one thousandth part has been touched by cultivation. From a mining standpoint, practically none of this vast area has been gone over even cursorily from a geological standpoint and any explorations that have been of benefit to those who seek to develop the country's mineral wealth, have been mostly of an accidental character or merely incidental to railway construction and the like. Some few areas have been made the subject of special study, like the Amur and Sakhalin regions, both of which have been the objective of special expeditions. Even roads, surveys of all but a small part of the country are lacking and no topographical surveys whatever have been made of the great mineralized areas such as the Sikhota Alin ore districts and the petroleum areas of Sakhalin.



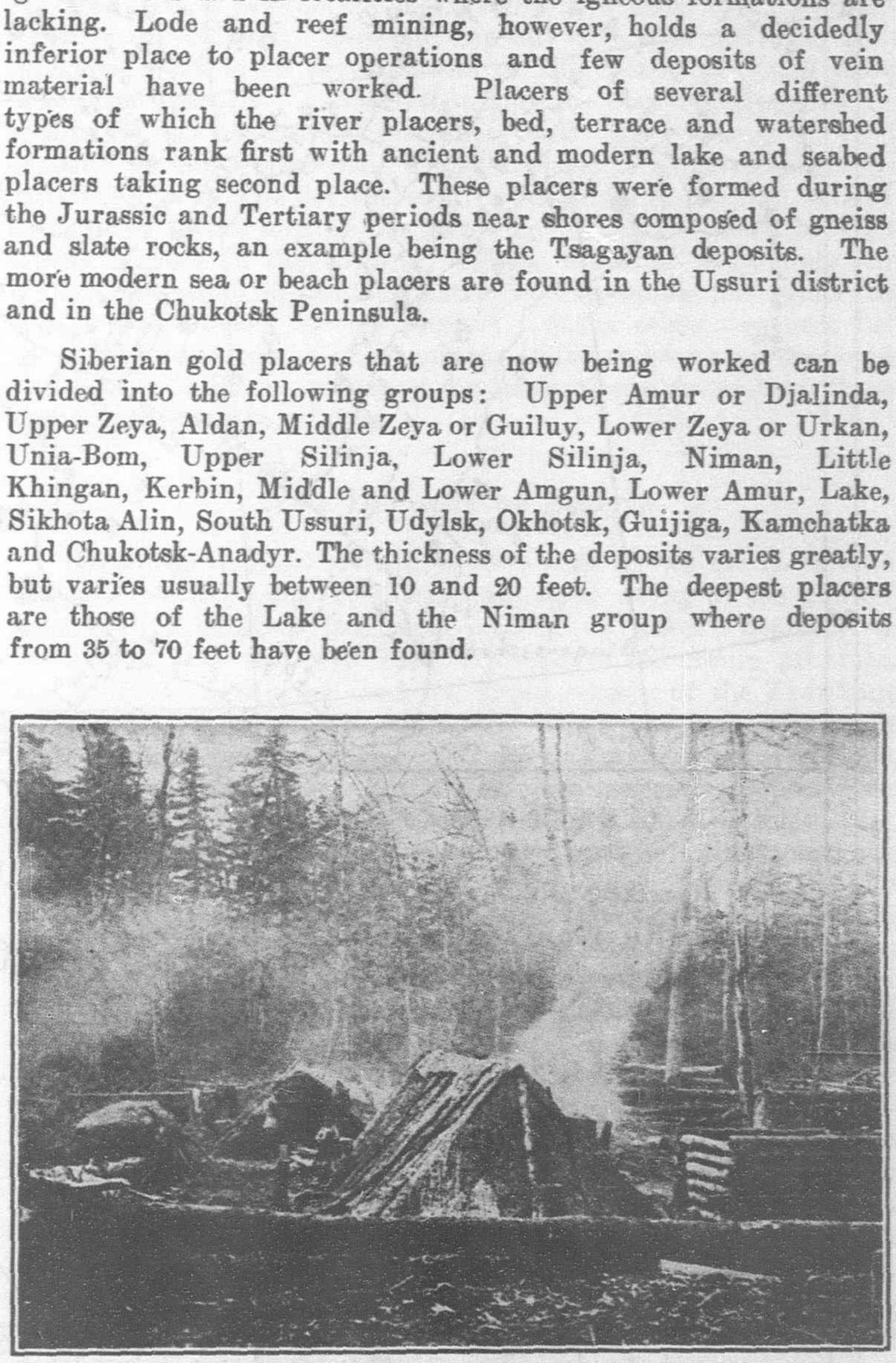
Sketch Map of the Anadyr-Chukotsk Region, North-east of Siberia.

While the Russian mining expert, Mr. Anert, is of the opinion that while the Russian Far East is rich in many minerals, yet the quantity of ore reserves are in no case of great magnitude, the writer cannot agree with him, believing that the Siberia gold placer deposits alone will produce enormously once their real development along modern mining lines is begun. Likewise the silver-lead-zinc deposits of Tetiukhe have huge reserves of ore and the coal deposits of Sakhalin are of such importance that they should now be competing with those of Japan and doubtless will take premier place among fuel deposits of the Pacific.

Gold Deposits of Siberia

Siberia's gold deposits are found in the region of gneisses and crystalline and metamorphic slates, both in the vicinity of igneous rocks and in localities where the igneous formations are lacking. Lode and reef mining, however, holds a decidedly inferior place to placer operations and few deposits of vein material have been worked. Placers of several different types of which the river placers, bed, terrace and watershed formations rank first with ancient and modern lake and seabed placers taking second place. These placers were formed during the Jurassic and Tertiary periods near shores composed of gneiss and slate rocks, an example being the Tsagayan deposits. The more modern sea or beach placers are found in the Ussuri district and in the Chukotsk Peninsula.

Siberian gold placers that are now being worked can be divided into the following groups: Upper Amur or Djalinda, Upper Zeya, Aldan, Middle Zeya or Guiluy, Lower Zeya or Urkan, Unia-Bom, Upper Silinja, Lower Silinja, Niman, Little Khingan, Kerbin, Middle and Lower Amgun, Lower Amur, Lake, Sikhota Alin, South Ussuri, Udylsk, Okhotsk, Guijiga, Kamchatka and Chukotsk-Anadyr. The thickness of the deposits varies greatly, but varies usually between 10 and 20 feet. The deepest placers are those of the Lake and the Niman group where deposits from 35 to 70 feet have been found.



Temporary Huts of Settlers from European Russia in the Amur Province.

As to the available gold in the placers that have been exploited, the General Zemstvo organization has estimated those of the gneiss slate type stretching from the Amur group to the Kerbin (the watershed strip) as containing 237,000 poods of 36 pounds or some 8,558,000 pounds avoirdupois. This comprises the chief placer deposits of Siberia. The following table shows the gold

reported to the authorities as having been mined, and the amount that was retorted in the smelters and laboratories during five years:

Year.	Reported.	Retorted.
1911	... 17,767.8 lbs.	38,451.7 lbs.
1912	... 15,958.1 ,,	37,148.2 ,,
1914	... 14,646.2 ,,	39,814.9 ,,
1915	... 16,755.9 ,,	44,314.2 ,,
1916	... 13,293.9 ,,	35,295.7 ,,

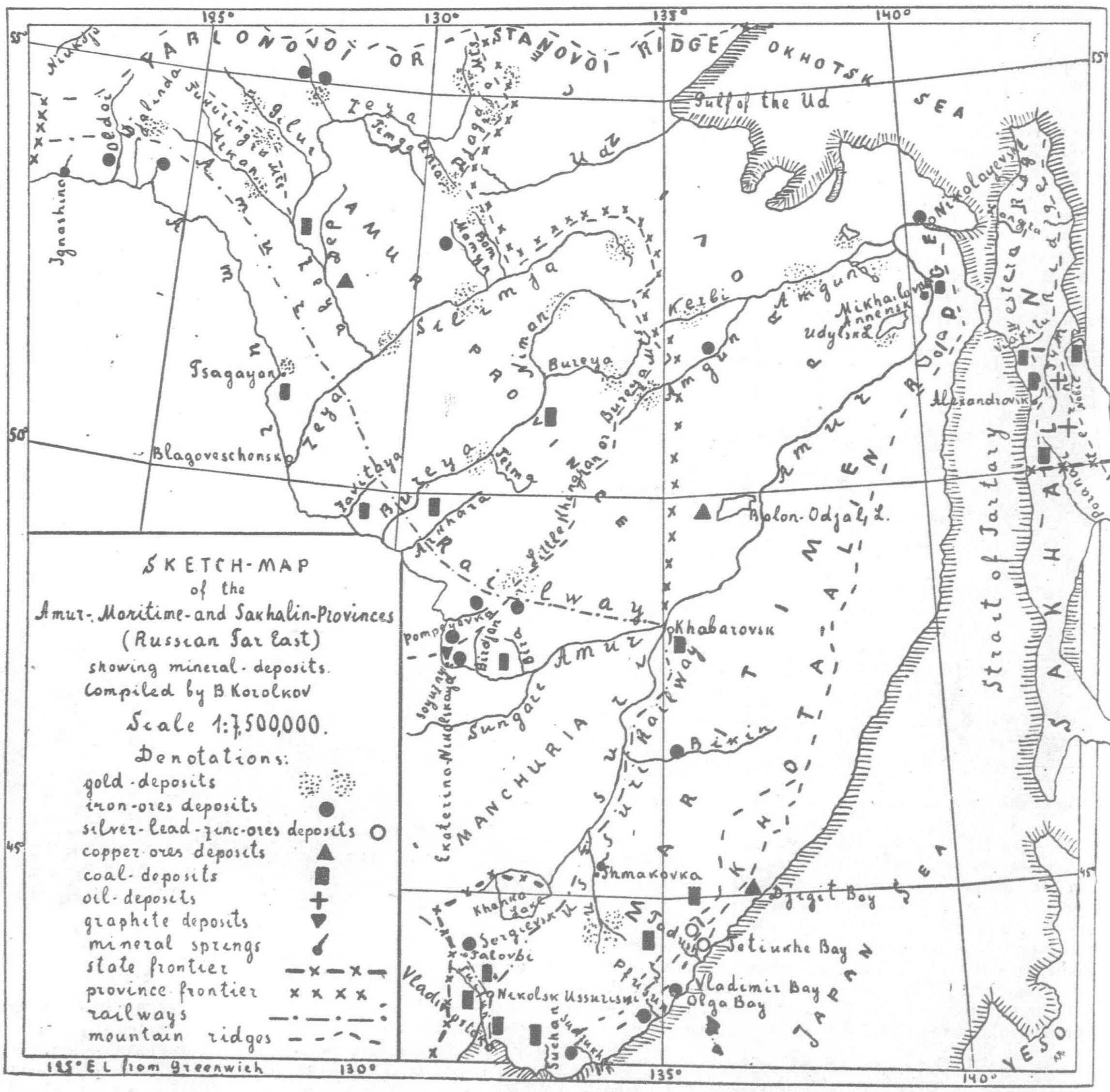
Even the statement of gold retorted does not indicate the full total won from the Siberian placers since a large part was sent to Ekaterinburg and some went abroad, while the Chinese miners carried quite a wealth of treasure over the southern border. In addition considerable gold hidden from governmental ken entered from the Transbaikal region and it is probable that the government report shows only one-third, perhaps only one-quarter, and estimates have been made that the total gold output from the Siberian placers is between 40,000 and 65,000 pounds a year with a probable average of close to 55,000 pounds.

In 1915 there were 282 placers being worked and 5,742 permits to prospect had been applied for. Surveys were made of 1,353 gold bearing areas and permits issued for their working. Of these 441 were mined according to the following methods: Man power 33, hydraulic 2, dredging 7, excavators 2, a total of 44. Aside from these larger enterprises were 397 "zolotnik" or tribute workings by smaller groups who operated under license from the concession holders.

Gold was produced by them as follows: Man power 2,081.7 pounds, hydraulic 67.71, dredging 2,160.3 and excavators 148.05 pounds, a total of 4,457.7 pounds for the larger operators, while the zolotnik workers mined almost twice as much, a total of 8,846.95.

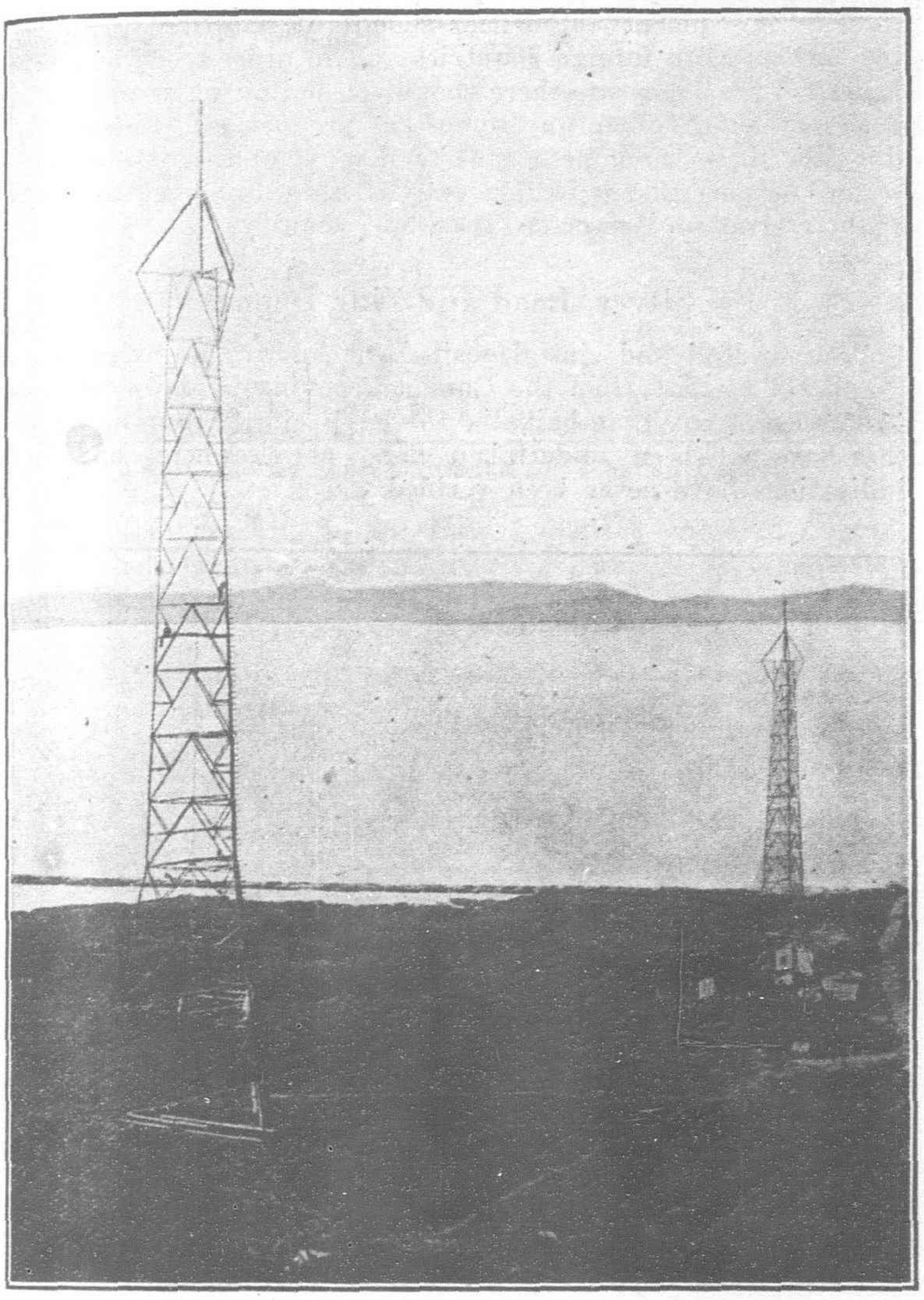
The distribution of the gold produced in the several mining districts was as follows:

Amur district 2,199.19 lbs.; Bureya, 3,407.55, Zeya, 2,475.37, Maritime 5,064.45, and Ussuri 158.12 lbs. a total of 13,304.68 pounds reported to the government authorities. Practically all this output came from the placers as the only lode mining reported was from the Ussuri district with an output of some three poods or 108 pounds. The workmen numbered 24,549 in all these mining areas and were largely Chinese who supplied 76.2 per cent., with



Siberia—Sketch Map of the Amur, Maritime and Sakhalin Province.

Koreans 13.4 per cent. while the Russian miners were only 10.4 per cent. of the number employed in gold mining. The larger part of the workmen were employed on the zolotnik basis where the foremen were compelled to deposit each day from 14.4 to 57.6 drams of gold for the privilege of working, the remainder of the gold they recovered being purchased from them by the holder of the concession at various rates not set forth in official reports.



Wireless Station at Petropavlovsk, Kamchatka.

One great advantage of mining ventures in Siberia is the ease with which machinery of every description may be obtained from the United States whose west coast has many manufacturing plants devoted solely to this class of equipment. Keeping this in view, those familiar with the conditions in Siberian mining areas look for large immediate extensions along the three following lines: New discoveries, intensification of production in existing fields and the discovery and development of reef gold. In the first of these categories, new discoveries are to be expected, mining engineers assert, first in the northeast, in the Udsk, Okhotsk, Kamchatka and Chukotsk regions. Secondly, those deposits in the basin of the Olekma tributaries (Tungir and Niukja), and those of the Aldan where the Tympton and the Sutam already are well known. Gold deposits may be expected in the slopes of the mountain ranges of Tukuringra and Jakja and others on the tributaries that flow into the Upper Bureya from the left. Another promising area is that between the Amur and the middle course of the Amgun while the Ussuri slope of the Sikhota-Alin range has great possibilities. The above are all placer prospects. Hydraulic mining on the Zeya, Unia Bom, Upper Silinja and Niman regions seems promising while dredging in the Kharga-Zeya and Kerby River in the Ussuri district, should be profitable even in the Tungir and Niukja rivers and the Udsk country where the "taliks" or frozen ground that must be thawed is of large extent.

Reef Gold Possibilities

Gold in situ or reefs of some magnitude has been found in the Ussuri, Amur and Kol-Kolchan regions, and even with its present slight development, the Siberian reef gold resources would arrogate first place in all Russian territory. The present difficulty in the way of systematic development is the lack of any scientific information regarding the country on a large scale. Geological explorations must be made not only from the placers as a groundwork, but with a single eye to mountain configurations and geological structure of the nearby regions. Topographical surveys are lacking and even the water courses have yet to be set down accurately from a hydraulic mining standpoint aside from their value as energy producers for power mining. Study must be made of the thermal conditions as regards the frozen and unfrozen areas. These factors must be joined with the opening of the 100 verst strip in which mining is now forbidden and some method must be found to stimulate rather than retard as at present the prospectors, those voluntary gold seekers whose work has extended to all other fields. The present rapacious method of working various concessions and the "truck system" of furnishing the miners' stores must give way to more equitable means of supply.

These are a few of the main difficulties hedging in mining ventures in Siberia. Foreign capital must be admitted and safeguarded if large developments of this potentially rich field is to come speedily. Asiatic labor must be encouraged and state credits for the purchase of machinery and the opening of new deposits should be fostered. The taxes should be more equitably distributed and that for the melting of gold into bullion should be reduced to one-half of one per cent. Prohibition of the free selling of gold in the mining regions allowing sales only in centres of commerce and industry would enable the miner to obtain better prices for his product. Many other measures for the relief and extension of the mining industry have been proposed and are still being advocated by associations formed of those actively engaged in mining.

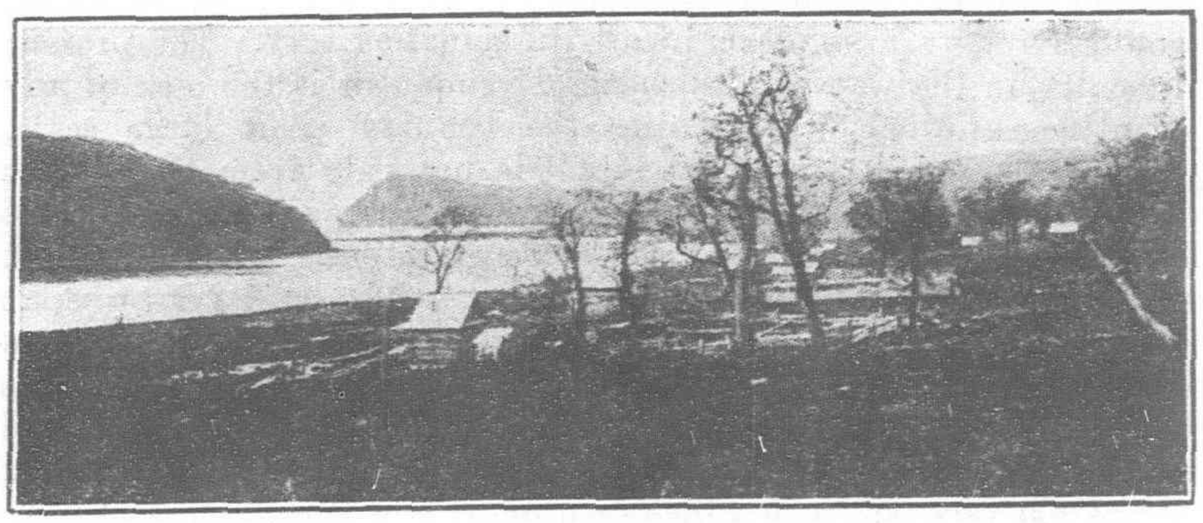
Iron Deposits of Siberia

Some iron deposits of Siberia have been known for more than 75 years but little attention was paid them owing to the quicker returns to be obtained from gold placers. Magnetite deposits are known but have not been fully explored in the Amur province, the basin of the Mamyn, and the upper reaches of the Yvatikane being especially promising while some discoveries have been made in the Great Sugdjara, Bryanta, Oldoi and Amgun River regions, as well as on the lower Amur. The chief magnetite deposits are in the South Ussuri district where the Olginsk area is the richest. These deposits are found in the contact of limestone and granite, the former being the most important factor.. The best deposit now known is that of the Bielaya-Gora, or White Mountain, on the right bank of the Arzamassovka rivulet, where three huge lenzes and some rich pocket deposits have been located near the Serafimovka village. True "load stone" ore is found in the St. Olga and St. Vladimir bays, and this is held to be second in importance of magnetite deposits. Other regions of iron ore are on the Sudzukhe River, near the Talovoi switch on the Ussuri railway and in other localities of the Ussuri district. The average percentage of iron in these deposits is not high, running about 40 per cent., although some parts of the deposits are much more promising. It is possible that with depth the quality of the ore will improve or that sulphurous ores will take the place of the magnetite. The ores now known must be concentrated before smelting, but the cost of this in the case of magnetite is not prohibitive.

After a magnetometric survey in 1917, the total ore in the Bielaya Gora deposit including the magnetic and the marble cape deposits was estimated at 2,040,215 tons, while the Sergievsk and Sudzukhe ores aggregated 243,745 tons more, a total of 2,283,960 tons.

Hematite ranks second. It is to be found in the Little Khingan Mountains mostly in connection with a series of metamorphosed limestone, hornstone and slate. The deposits are situated in two meridional layers—the southern—stretching from

the Amur, near the cossak village (staniza) of Ekaterino-Nikolskoye, to the river Pompeevka, and—the northern—from the Londoko station on the Amur railway to the upper part of the Bidjan river.



New Settlement in the District of St. Olga, Maritime Province.

The layers of hematite are generally in the form of lenzes which sometimes attain a thickness of about 140-ft., the percentage of iron in the ore varying from 35 to 65 per cent. The total ore of the southern field is estimated at about 2,708,250 tons, whereas the northern deposits have scarcely been explored at all. This ore must also be concentrated before smelting and separated from the intermixture of hornstone.

The researches of Anert disclosed that the Sergievsk deposits in the Ussuri district were not hematite, but consisted of magnetite and bog-ore. Bog-ore deposits are frequent in the area of Sudsukhe and on the lower Amur, one of the most important being situated within the town of Nicolaevsk on the Amur. It is a lake deposit stretching over basalt formations containing a considerable percentage of iron and has been formed in the Quaternary period by sediments of ferroneous springs. These ore deposits generally take the shape of lenzes.

According to several estimations they contain about 902,750 tons of ore, with a percentage of iron from 40 to 50 per cent.

Spherosiderites have been discovered on the Bikin river and among the carbonous sediments of the Tertiary period.

The following table shows the estimates of iron ore in the country:

	Magnetie	Hematite	Lemonite
	in thousands of tons		
Olginsk area	2,040	—	—
Sudzukhe	126.5	—	126.5
Sergievsk	117.5	—	144.5
Little Khingan	—	2,708	—
Nicolaevsk Amur	—	—	903
	2,284	2,708	1,174

or 6,116,000 tons of ore containing about 2,527,700 tons of metal.

The outlook for the iron industry in the Russian Far East is not very bright, and it would take long and strenuous research work and the opening of the country to civilization in order to put it on the same line with Western and Central Siberia, though the far-eastern deposits are by far the richest in Russian North-Asia. The imports of Russian and foreign iron-ware into the country show that the yearly quantity needed by the Far East amounts to about 72 thousand tons and this could be easily supplied by the existing deposits. The vicinity of coal mines (in the Suchan area and on Russian Sakhalin) and transport facilities as offered by the sea, the Amur river and the Amur railway, all tend to further the development of the iron industry, at least on a small scale.

But it would be of the first importance to continue the investigation of all known deposits and verify the rumors which are current on this subject. Geological explorations should be combined with magneto-metric surveys and no effort be spared because the future of the iron industry is closely connected with the development of this country in the way of railroad construction, etc., the present conditions of which being one of the principal obstacles to colonization.

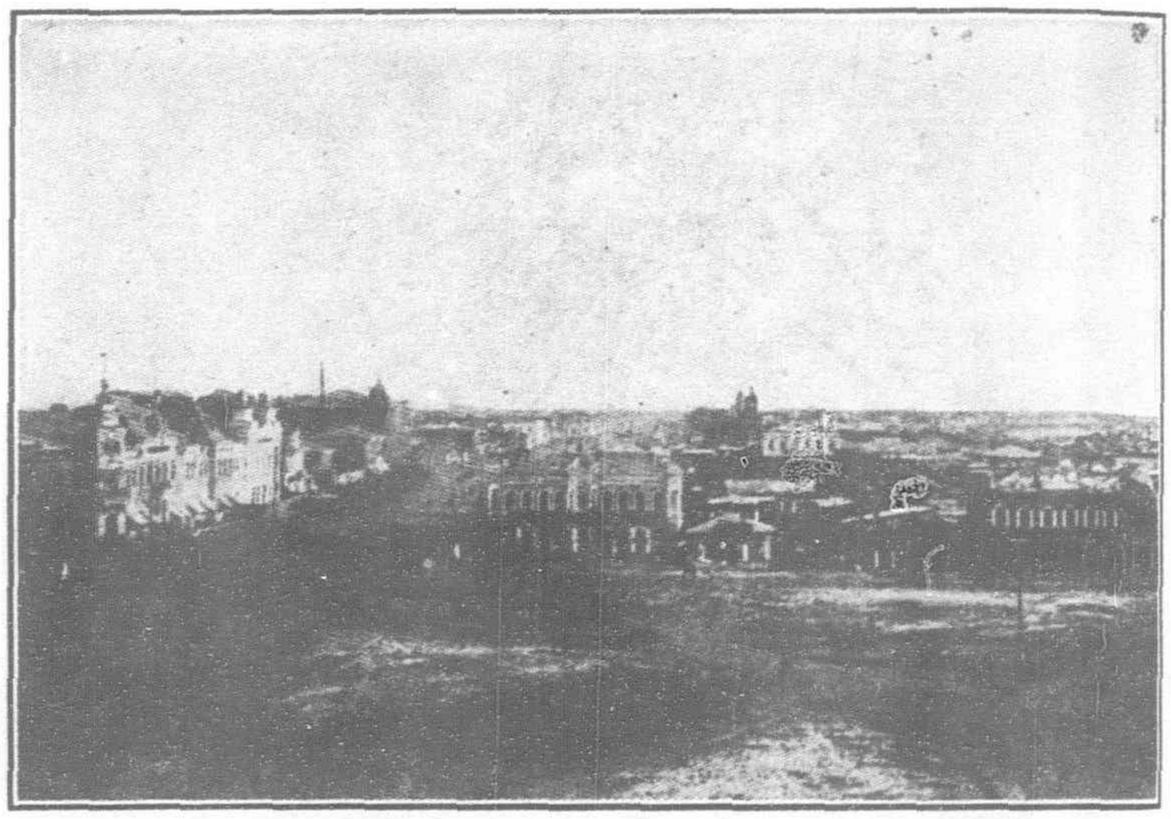
Actually iron-ore is produced only in the Olginsk and Sergievsk districts. With the prevalence of a system of compulsory production (about 44,500 cubic feet per claim being obligatory) the average yearly output varies between 9,000 and 18,000 tons, whereas the total stock of produced ore amounts to 27,000 tons.

The producers have many a time, but unsuccessfully, applied for a permit to sell the above ore to Japan. (In that country the marketable ore has to contain not less than 50 per cent. of iron and no more than 15 per cent. of silicium, 0.1 per cent. of sulphur and 0.05 per cent. of phosphate).

The government authorities should unconditionally prohibit any such sales to foreign countries and in order to encourage the owners of iron deposits there should be built iron foundries and other plants. Another way to enforce production, which has been sluggish, there being no means to dispose of the output, would be for the government to take over all these ore-deposits, because of their great importance to the whole country.

Silver, Lead and Zinc Deposits

Silver, lead and zinc deposits are known to exist in the Russian Far East from the Chukotsk peninsula down to Korea, and others from Transbaikalia to the Pacific. Thorough researches have not been undertaken here, as elsewhere, and many indications have never been verified.



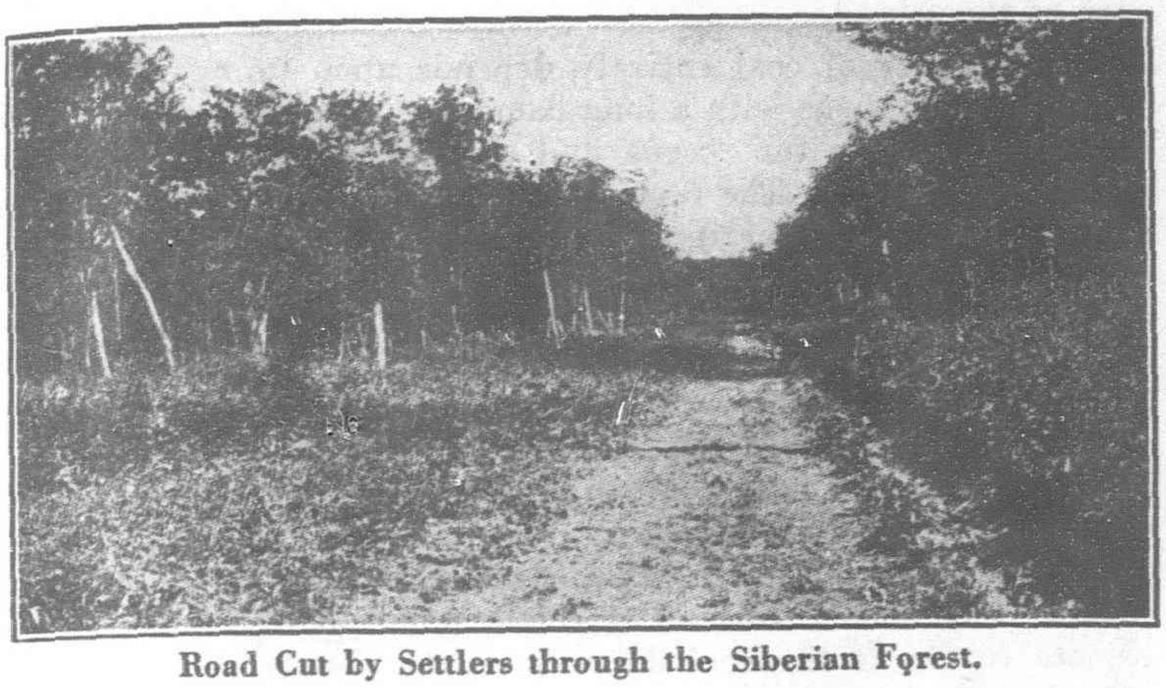
City of Blagoveschensk on the Amur.

The largest deposits of this ore not only in the Russian Far East, but in the whole of Russia, are those situated on the southern part of Sikhota Alin range, and particularly in the area of Tetiukhe. This has been explored by B. J. Bryner and P. T. Polevoy. The ore is found in a deposit of the contacto-metamorphic type and consists of sulphurous minerals—galena and blend, superposed by calamine, smithsonite and ochric substances. The whole has the shape of a lenz. The deposit is in contact with hedenbergite, the latter being closely intershifted with sphalerite and galenite is an important factor at the concentration of the ore.

The total quantity of ore is estimated at about 1,765,000–2 million tons, containing, on the average, 12 per cent. of lead, 17 per cent. of zinc and 280 grammes of silver per metric ton. The concentrating mill of the mine is in a position to put out annually from 70 to 50,000 metric tons of ore, the produce being:—concentrated lead, containing 70-72 per cent. of lead, concentrated zinc (33-37 per cent. of pure zinc), half-products containing about 27 per cent. of zinc and dump (slick)—with 13 per cent. zinc. The mill could be improved by introducing oil-concentration and would be then able to produce concentrated lead of 80 per cent. and zinc of 90 per cent. of pure metal. It would also be necessary to introduce a device for mechanical separation of the ore previous to it being concentrated.

There being no foundries the whole enterprise is entirely dependent upon the Japanese market where the concentrated lead is disposed of. Before the war it was possible to ship calamine to important European places, as London, Amsterdam and Hamburg.

The present output of the Tetiukhe works may be raised to 63,000 tons of metallic lead, 7,200 tons of metallic zinc and 25,300-lb. of silver. At the same time it is possible to develop sulphuric acid for cellulose works and the refinery of petroleum if the latter industry be developed on Russian Sakhalin.



Road Cut by Settlers through the Siberian Forest.

The other deposits in the Ussuri district—those of Olginsk, and on the Pfusun and Wanchin rivers are not very important and quite depend upon the Tetiukhe works for smelting and concentration of their ore.

Some deposits of silver pyrites have been discovered on the Kamchatka peninsula and along the coast of the Okhotsk sea. Following is the output of the mines in the Ussuri district (Tetiukhe)—in tons of 2,000-lb. each:

	Sulphurous ores.	Calamine.
1911	4,983	26,907
1912	5,629	31,420
1913	33,184	29,482
1914	69,572	23,432
1915	55,124	8,673
1916	62,382	5,993
1917	104,975	783

of which there were exported

	Calamine	Sulphurous ores	Concentrated lead
1910	19,900	—	—
1911	23,156	—	1,643
1912	25,214	—	140
1913	11,002	—	150
1914	—	—	90
1915	—	446	—
1916	—	5,500	—
1917	—	6,840	—

The yearly consumption of these metals in the Russian Far East is as follows—lead from 180 to 450 tons and zinc—from 36 to 54 tons. Accordingly the Tetiukhe works are not only in a position to supply the above quantities, but are obliged to look for foreign markets to dispose of their produce of which silver will always be readily taken up by China.

Copper Deposits

Indications of copper are very abundant in the Russian Far East and a glance at the map will confirm this assertion. We mention only copper-island in the Behring Sea, Copper Cape in the Straits of Tartary (between the mainland and Sakhalin) and the copper-springs in the Ussuri district. Copper is to be found on the Amur near the Bolon-Udjal lake, on the river Zeya, etc.

Copper ore is always very conspicuous owing to the lively coloring of the copper-oxides. Up to the present time mining work has been done only on two of the Ussuri district deposits, situated on the Djigit bay and owned by the Siberian Mining Co. (Peppel and Ozmidoff). One of these deposits is on the sea shore interposed among metamorphic slates. The other one lies in the valley of the copper rivulet and consists of veins. In both cases the ore is chalkopyrite. Individual pieces of ore contain from 5-8 per cent. of copper, whereas the average does not show more than 1.5 per cent. of metal, which is not sufficient for industrial purposes in the Russian Far East (the minimum percentage being 2.5-3 per cent.).

The Djigit mines produced the following quantities of copper-69 tons in 1911, 144 in 1913, 136 in 1916 and 11 in 1917. This is obviously quite insufficient as the yearly average consumption of copper ware in the Russian Far East is about 2,300 tons. On the other hand the copper mines in the Russian Far East would never be able to compete with the highly developed copper-industry in Japan, nor with the rich copper deposits in Western Siberia, which are gold-bearing.

Information on other mineral substances of the country is very scanty, and no particular attention has ever been paid to them. Considerable deposits of Antimony have been discovered on the Boguchan mountains; graphite—on the Amur river (near the village Soyuzny) and sulphur on the Kamchatka peninsula. In addition arsenic-ores, cinnabar, mica and other minerals have been traced.

Up till the present time salt has nowhere been discovered and there are no prospects of discovering it. This is greatly to be regretted as salt is one of the most necessary commodities to the flourishing fishing-industry of the Russian Far East which consumes alone about 90,000 tons a year.

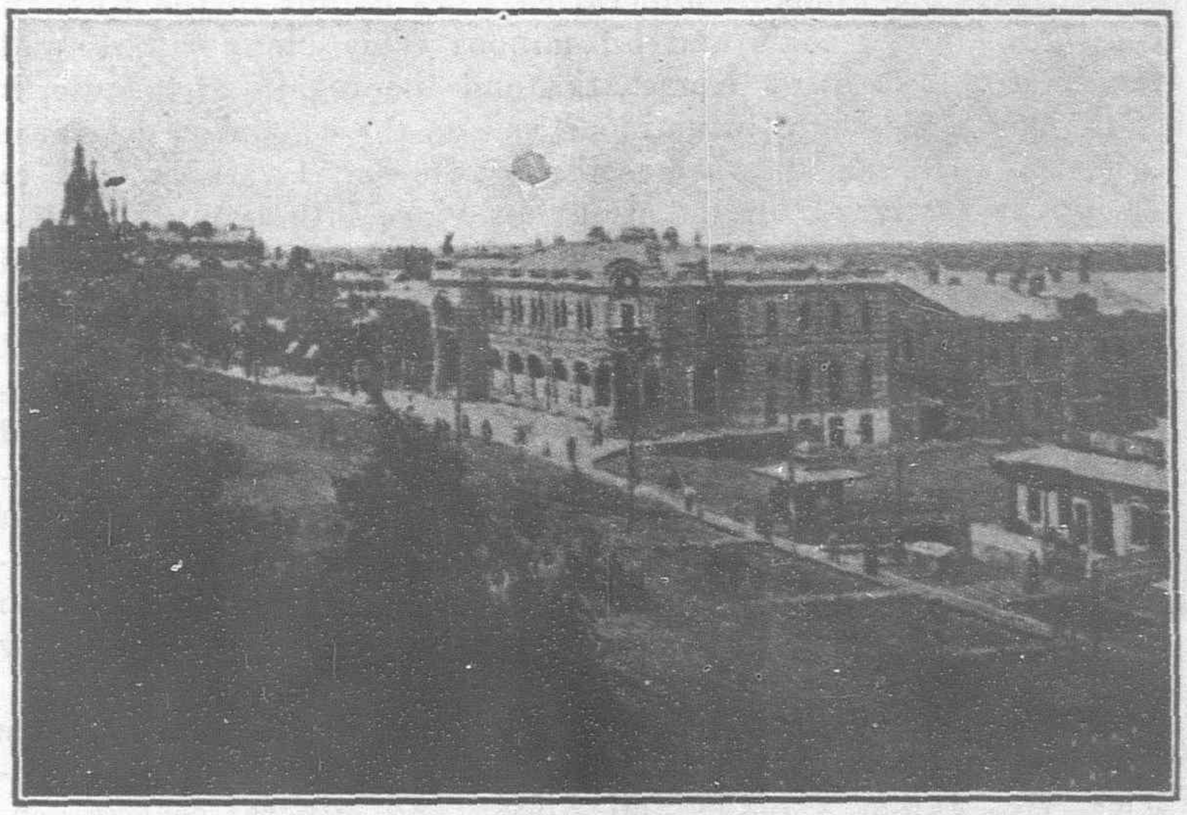
It would not pay to carry salt from the Yukutsk province and, probably, it will be imported again from the Suez canal, Germany and South Russia, as soon as freight rates get lower.

Mineral springs have been located in many places of the Russian Far East. In the Amur province are known the Ignashinsk alkaline-acid and the Kuldursk hot-sulphate springs, and the Anninsk hot springs near the Amur estuary. In the Ussuri district is located the carbonic spring near the Shmakovka village; then there are the Agsevski hot springs on Sakhalin and many volcanic springs on Kamchatka.

These springs have never been explored from a geological or balneological standpoint. The so-called "watering places" are in so bad a position that would-be patients lack even the most rudimentary comfort.

Mineral Fuel

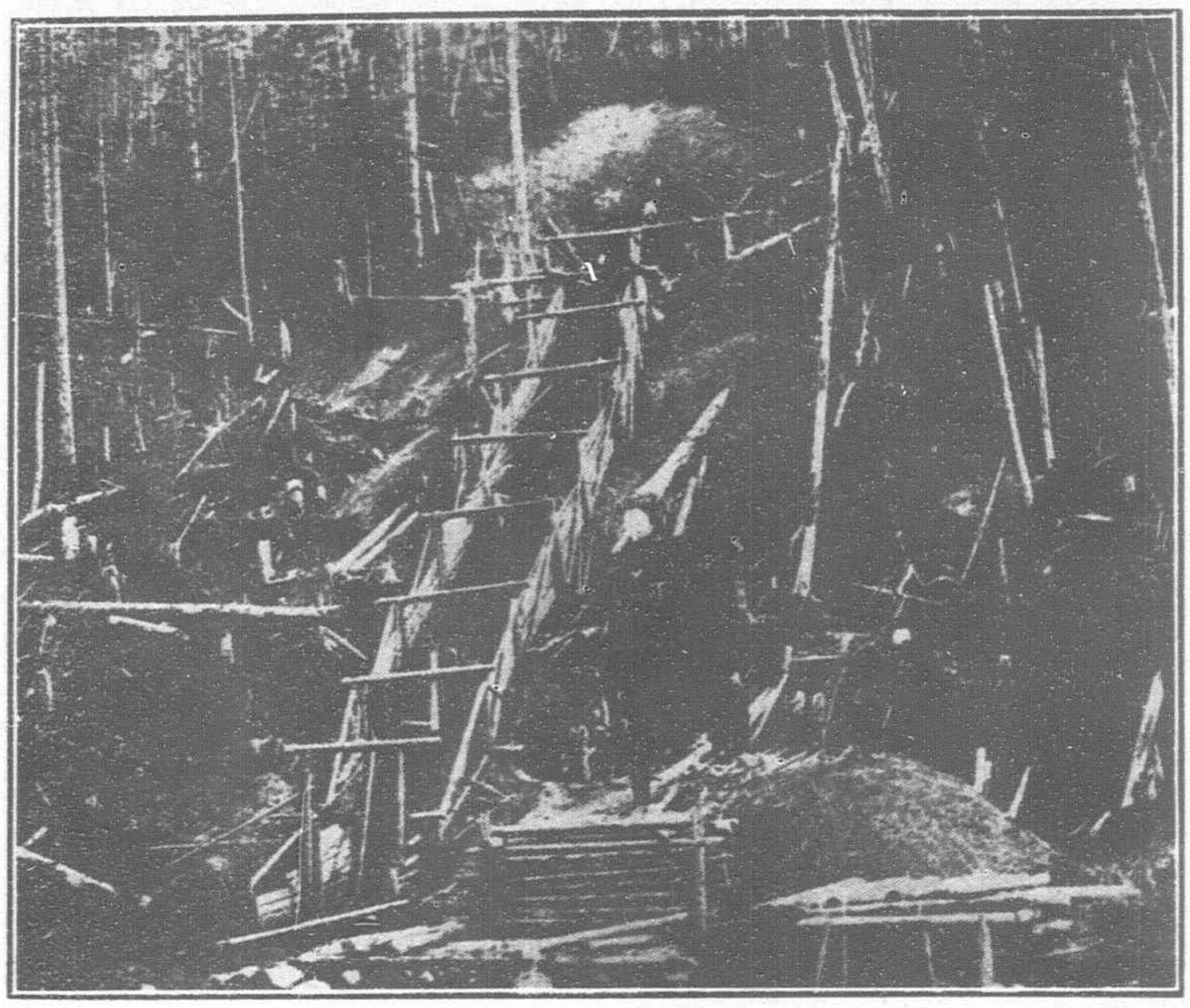
Coal.—Mineral fuel is rightly considered as the life-essence of any industry at the present time. The importance of coal-mines is generally more or less dependent upon the transportation facilities, particularly in a country like Russia with bad means of communication. That is why the coal deposits in the Russian Far East, situated more or less closely to the coast of the Pacific Ocean, are destined to play a very important rôle in the future.



Principal Street in Khaborovsk on the Amur.

The Pacific Ocean is at the present rivalling the Atlantic and very fast becoming the most lively ocean highway of the nations. Though it still ranks second in the estimates of trans-oceanic cargo traffic, the opening of the Panama Canal and the fast

development of commerce and industry in all Pacific countries which have the advantage of possessing their own raw material, foreshadow that eventually the centre of gravity of world-commerce will be shifted over to its shores. The first indications of such an evolution may be seen in the increase of the consumption of coal. Even now the output of mineral fuel does not keep pace with its consumption.



Sakhalin—Coal Mine.

At the present time the principal coal-supplying countries on the Pacific are Japan and Australia. China abounds in very rich coal deposits, but these are chiefly a great distance from the coast. The difficulties of transport and the general economic conditions of the country force her to rely upon the import of foreign coal, mostly from Japan.

The Western United States and the countries of South America are great consumers of coal, but they do not possess large deposits of their own and depend upon importation. British Columbia and Alaska are in a much better position and produce quantities sufficient for all local requirements.

The time will not be long when the Russian Far East will become involved in the current of international traffic and trade and then the question of coal supplies will become even more acute than it is now. At the present the Far East is subject to a continuous coal crisis.

All existing kinds of mineral coal are extant in the Russian Far East—brown coals and bituminous coals, long-flamed and anthracite. Excepting Kamchatka and the region to the north of it, most deposits of bituminous coal on the continent originate from the Jura-period, whereas the brown coal layers go back to the upper tertiary. In the Amur province bituminous coal has been discovered in the area of Zeya-Depsk, Bureya-Terminsk and along the river Bira, and brown coal in the Bureya-Zavitinsk region, on the Arkhara river, the Zagayan mountains and several others. The South-Ussuri district ranks first in the Maritime Province and the most important bituminous deposits are situated in the surroundings of the cities of Vladivostok and Nikolsk-Ussurisk, on the northern slopes of the Sikhota-Alin range, on the lower course of the Amur near the cossak village of Mikhavlovsk. Brown coal has been found in the Vladivostok area too and then, more to the north, on the river Tadush, in the vicinity of the city of Khabarovsk, and in some other places.

In the island of Sakhalin and the Kamchatka peninsula the coal-bearing strata are much the same as in other Pacific countries, viz., Japan, Canada and Alaska and mineral coal is generally located in deposits of the tertiary and cretaceous eras.

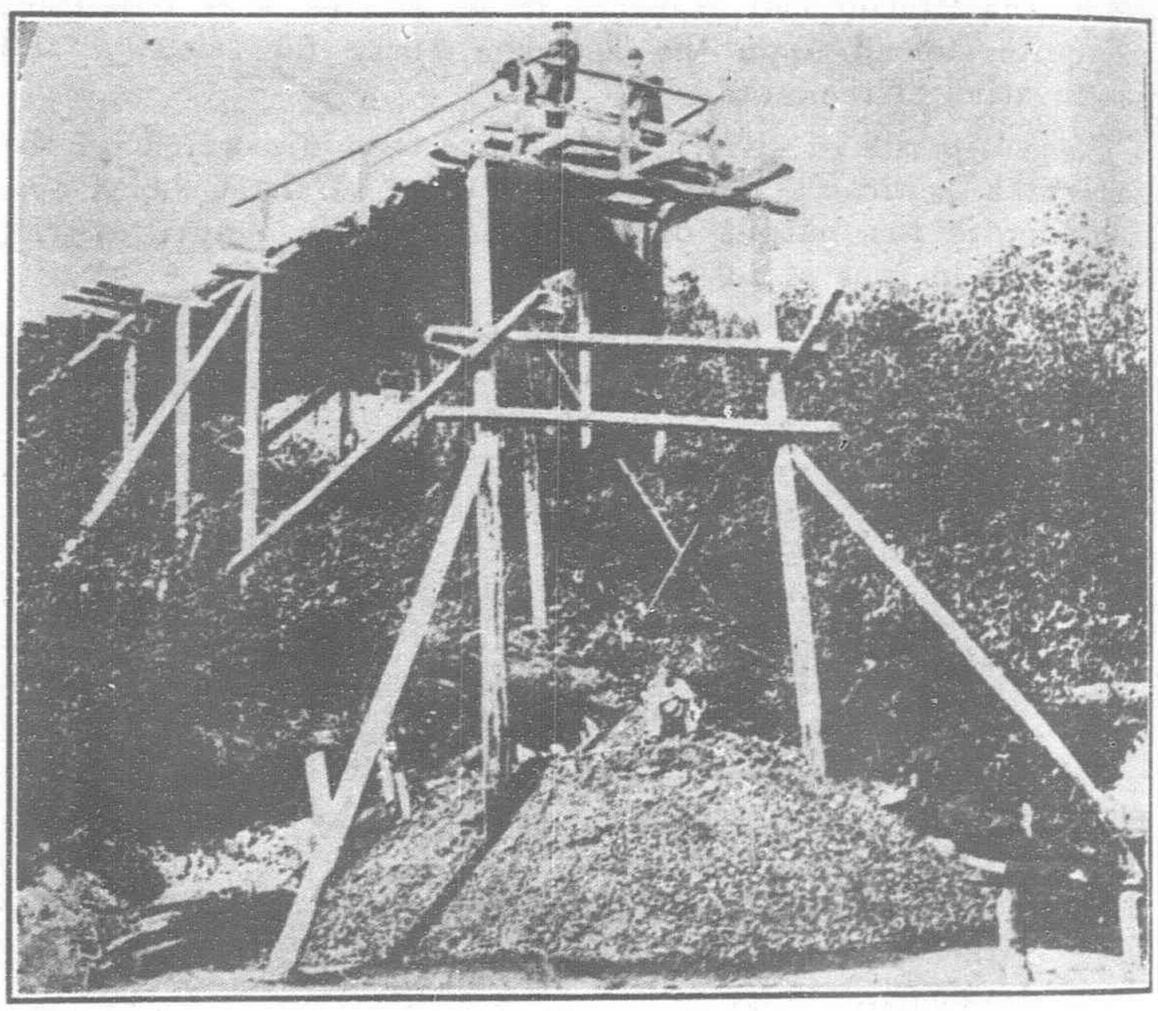
The miocene and cretaceous coal deposits are very important, while the eocene (later tertiary) coal is distinguished by its excellent qualities—it is a perfect coking coal which leaves practically no ash.

The island of Sakhalin contains the richest coal deposits in the Russian Far East. The principal area is situated along the western mountain range and stretches from the river Viakhtu to the Japanese frontier. In the east, coal is found on the eastern slope of the eastern range from the Ossoy mountain to the Nabil river. Several less important deposits exist in the northern part of the island.

The quality of coal entirely depends upon its age. Miocene coal generally burns with a long flame and is slightly bituminous, whereas coal from the eocene and cretaceous areas is coking and highly bituminous. The cretaceous coal yields ash from 15 per cent. and up. The quality of mineral coal is subject to considerable variations dependent upon the tectonic structure of the soil or the proximity of volcanic strata.

The coal district in Kamchatka, lying between Baron Korff's bay and the Anadyr river, is but little explored.

The importance of the deposits on the mainland is purely local, whereas Sakhalin coal might acquire a world-wide reputation, Kamchatka's deposits may serve to give additional freight to ships plying northwards and provide them with coal for the way home. But all this is a question of a more or less remote future as the coal deposits of the Russian Far East are practically unexplored.



Sakhalin—Coal Mining

The approximate estimate of mineral coal in these districts would be, as follows:—

	In thousands of tons			
	Amur province	Maritime province	Saghalien	Total
Brown coal	406,237*	3,611†	1,806	411,654
Bituminous	903‡	39,721§	2,708,250	2,748,874
Total				3,160,528

In other words, the estimated stock of mineral coal in the Russian Far East amounts to more than 3,000 millions of tons. The Sakhalin coal is of the highest standard and its best sorts, particularly those of the Dui stratum (Paleogene) excel by far those of Japan.

Coal-production is very little developed and in no comparison whatever with the huge available deposits of Sakhalin, where one of the principal obstacles in the way of a regular coal industry is the absence of a good harbor.

* Bureya-Zavitinsk
† Ussuri
‡ Zeya Depsk
§ Ussuri

The most considerable output is effected in the Ussuri district, which was, as follows (in thousands of tons):—

	1915	1916	1917
Private mines	205	248	238.5
Government-owned Suchan mine ...	226	298	317
Total	432	546	555.5

Thousands of Tons

	1915	1916	1917
In the Amur province	4	1†	1†
Sakhalin	31	19	14.5
Total for Russian Far East production	467	566	571
Import of foreign (mostly Japanese) coal	92	53	28
Therefore coal consumption may be estimated at	559	619	599

Camp of Convicts Employed at the Construction of the Amur Railway.

Taking into consideration the several other less important mining areas, the total consumption of mineral coal in the Russian Far East may be put at about 720,000 tons a year. Technical exploitation, except at the Government-owned Suchan mine is on a very low level and more comparable to common handiwork than a regular industry. The output of the Suchan mine is restricted by the transporting capacity of its railroad, which is unable to carry more than about 235,000 tons annually.

A great impediment to development on a larger scale is the practical absence of capital in the country.

In the coal industry it is very essential to use the proper quality of coal and in this respect coking coals are by far the most important.

By-products of the coking procedure, as ammonium-sulphate, benzol, toluol, aniline and alizarine colors may substantially change the whole character of the industry and furnish a lot of useful articles to the country. Production *en masse* could be furthered if only the ways of communication were improved. The Suchan area must get an outlet toward the Nakhodka bay and be connected by a broad gauge line with the Ussuri railway.

In Sakhalin a regular port should be constructed at Alexandrovsk, as it is the natural centre for the rich coal districts in its vicinity and on the Great Alexandrovka river. More remote regions with large coal deposits are apt to build their own ports, whence the output will be shipped to Alexandrovsk.

It would take only about five years to raise the coal production of Sakhalin to one million tons a year and if proper harbors be constructed and developed the annual increase of the output would be about 20 per cent.

Special stress should be laid upon the continuation of researches in all the coal-bearing areas. In the Ussuri region a thorough investigation should be made of the Middle Suifun area (near to the city of Nikolsk-Ussurisk) and of the district to the north of Suchan up to the Sikhota-Alin range. In the Amur Province the Bureya-Terminsk area has to be explored and in Kamchatka the almost unknown region along the coast of the Behring Sea, from Baron Korff's bay to the Anadyr river.

On Sakhalin Island investigations should not be confined to the western slope of the coal district in the west of the isle, but also extended to the eastern (Poronay) incline. The eastern range should be explored along with the research work done on oil fields which are situated in the same area.

In order to get an exact picture of the importance of the coal deposits and industry in the Russian Far East it would be necessary to make a comparison with the principal coal-producing (Japan and Australia) and coal-consuming (China, Western States of America, the Philippines) countries of the Pacific.

Petroleum.—Petrol oil will always be one of the most important industrial factors in the country, because of its high heating value, its easy handling, the various uses which can be made of it. Its production too is comparatively simple.

It is very dangerous to draw any premature conclusions on oil-carrying districts before a careful investigation has taken place.

On Sakhalin island oil has been located on the east coast from the Okha river in the north and almost down to the Languery river in the south—a distance of about 180 miles. The geological expedition in 1908/10 located 14 seepages, at the present 20 are known. There are 9 deep-bore layers—2 on the Noglik, 2 on the Nutovo, 4 on the Boatassyn and 1 on the Okha river.

The average depth of these deep-bore holes is about 480-ft., the deepest is that belonging to a Mr. Kleye on the Boatassyn river, its depth is 930-ft.

Boring was not done scientifically from a geological point of view. It was mostly of a casual character and depended upon the facility of obtaining the necessary implements and was carried out in places where there were natural seepages of oil.

Boring was made with water; accordingly a water-stopper was formed and the percentage of oil consequently appeared to be small. The quality of oil improved the deeper the boring was effected. The oil contains but little benzine and no parafine and is of the naphthaline quality.

There is no doubt that oil of a better quality will be discovered in Sakhalin; it should also be considered that just as in the oil district of the Japanese province of Echigo, the oil is improving with the increase of depth.

City of Petropavlosk on Kamchatka.

The seepages occur in very unfavorable conditions, mostly in swampy localities covered by a dense vegetation. The underground is formed by post-pliocene strata concealing the outlets of the regular oil fields. Therefore there is only one way of exploring the geological structure of the soil, *i.e.*, to drive small shafts and surface-trenches, or to practise hand-boring in order to locate the correct points for placing deep-bore holes.

† Total output from 1911 to 1916 amounted to 6,485 tons. Exact information is, however, wanting.

It is supposed that the oil on its way to the surface passes through a series of recent tertiary sediments consisting either of lower horizons of pliocene or higher horizons of meocene. But the quantity of oil-carrying horizons, their importance and saturation have never been ascertained. The tectonic problem has to be cleared up, too. There is no doubt that the general direction of the seepages falls in with a certain tectonic line and this correspondence is confirmed by several newly discovered seepages. But the geological cross cutting still remains a riddle. The descent of strata on a large surface has been observed on the east side of the horizon and there is no trace of anticlinal folds which are so greatly appreciated by oil experts.

Inner Harbor of Petropavlovsk.

Anert is of the opinion that the folds are isoclinal, whereas Polevoi and Tikhonovitch are more inclined to the presence of graduated folds.

The east coast of Sakhalin is almost uninhabitable though there are a few good harbors (the entrance to the bay of Chay is 21-ft. deep). The navigation period is a very short one and never exceeds 4 months. The vicinity of Japan is of the greatest importance it being possible to study there analogous geological difficulties which have been overcome by science and technical application. The usual claim system is not apt to further the development of the oil industry. The best way to encourage private enterprise on the part of sound companies would be to grant them concessions. This would only be just, as preliminary studies of the deposits, of conditions of navigation, building of pipe lines, etc., involve enormous expenses.

Twenty-five years have gone by and nothing has yet been done in order to make a valuation of the industrial importance of Sakhalin oil, in spite of many private attempts and researches; and many more will pass without any practical result if the question is not taken up on entirely different lines from those of the past.

A good example of what may be accomplished through the concessions-system is shown on the Urals where the concession of Mr. Leman has ultimately developed an area which now ranks third among the oil-producing districts in Russia.

The present article is by no means a definite condemnation of mining industrial prospects in the Russian Far East. The purpose of the author is merely to draw a picture of the actual information concerning this vast stretch of territory, only one-thousandth part of which has been touched by civilization and explored. There may be no doubt that the industrial and trading conditions in the country will in a while be subject to the most radical changes. In the first place foreign capital will have to become the most important factor of future development. It will invade first of all the Russian Far East which will soon experience its imperative hand on every side of industrial life. Very much will depend upon the sagacity of the leading men gradually to alleviate the political importance of such an evolution. The growth of Russian capital and Russian labor can only be brought about by a far-seeing and continuous policy.

Mining in Western Siberia

[*Weekly Bulletin, Canadian Department of Trade and Commerce*]

A well-known American mining engineer has contributed a few notes in the Vladivostok newspaper "Echo" regarding the mineral wealth and development of the mining industry in Siberia. The engineer has been connected for many years with mining enterprises in Siberia, notably the placer gold mining on the Lena River. The following notes on the mining industry of Siberia should therefore prove of interest:

The years 1907 to 1915, inclusive, witnessed a remarkable activity in the development of a few of the gold and base-metal deposits of Siberia and the Urals, under the auspices of British capital and the technical control of American engineers.

Kyshtim Copper Mines

The Kyshtim Mining Corporation (Ltd.), was built up from the ruins of a semidefunct Russian company which had mined copper in a desultory way for a period of nearly a century before 1919. About £900,000 [$4,380,000] was raised in London by means of debentures, and pyritic smelting of the ore was introduced from abroad. This was found to be the salvation of the property, and under able direction the Kyshtim, from being an abandoned mine, became the largest copper producer in the Russian Empire. In 1916, the last full producing year, the output approached 15,000,000 pounds of metallic copper annually. This, although large for Russia, is only one-quarter to one-tenth of the output of the large "porphyry" copper mines of the United States. A considerable output in gold was obtained yearly as by-product.

The published reports indicate that when the mine was closed down owing to "nationalization" some 3,000,000 tons of 3 per cent. ore still remained as reserve, established by development. Much of the ground is still unprospected, and besides important iron deposits which are worked on the property, an important discovery of nickel ore has been made.

The pre-war cost of producing copper at this property compared very favorably with the average cost at American copper mines. Following the political crash in Russia, the cost became prohibitive, and at the present time there is no demand for the product, even did the political conditions allow of the property's being operated. It will probably take three to five years to restore this property to its former productiveness, even after the restoration of peaceful conditions in the Urals.

Other Ural Copper Mines

Other copper-mining properties in the Urals were Sissert Co. (Ltd.), the Verk-Isset Co., the Bogoslof Co., the Revdinsk Co., and the Tanalyk Corporation (Ltd.). In the Kirghese-steppe region the Albazar Mines (Ltd.) and the Spassky Co. (Ltd.) also operated in a small way. The last three mines mentioned were controlled largely by British capital.

Both the Sissert and the Revdinsk properties near Ekaterinburg were in the development stage, but with good promises for the future, the ore being in many respects similar to Kyshtim. The Tanalyk property in the Orenburg district, although started as a copper mine, was proving to be a more important producer of gold than of copper when operations were suspended in 1917.

A most important copper deposit of the "porphyry"—that is, disseminated ore—variety is stated to have been partly prospected by drilling by the engineers of the Irtysh Corporation. This property is situated adjacent to the Ekibastus coal field, to the west of Pavlodar. In the published reports the company has merely referred to the deposit in a general way, but it is said to be of large dimensions.

Summary of Copper Situation

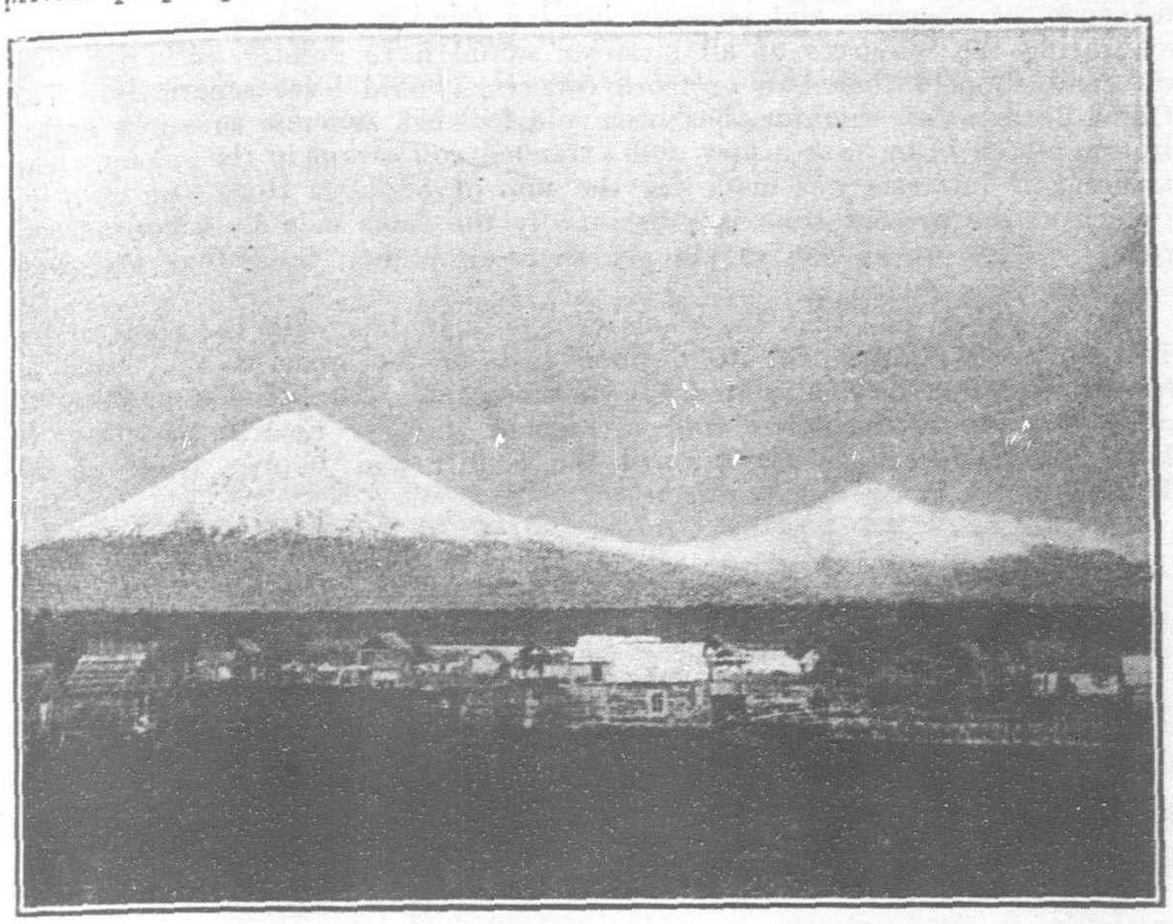
Altogether the production of copper in Russia and the Caucasus in pre-war days was small, not filling the demand. It was infinitesimal as compared with what will be possible when the known deposits are exploited. Siberia, unquestionably the world's greatest storehouse of copper as well as of gold, produced practically no copper previous to the closing down of the industries due to the revolution. The Spassky Co., previously referred to, produced a few million pounds annually, but with this exception the writer knows of no copper produced in Siberia

It should be noted that the price of copper in London has dropped during the last eight months from £153 [$745] per ton to about £77 [$375] at last advices, so that notwithstanding the bounty of £23 [$112] per ton given by the Russian Government to copper producers it is not likely that domestic producers will be able to compete with imports for some years to come. Probably the first successful copper mining on any considerable scale will be in the porphyry deposits, which can be mined by open cut with steam shovels, a minimum of hand labor being required.

Lead, Silver and Zinc

The two well-known base-metal districts of Siberia are the West Altai and the Nertchinsk-Argun regions. A much less known region recently developed for the production of zinc is the Te-Tu-He region, about 200 miles north of Vladivostok, only 20 miles inland from the sea coast.

Notwithstanding the fact that the Nertchinsk mining district was known over 200 years ago, it, like the Altai region referred to, is still in the development stage. Both these districts are extensive, as large as whole States in the United States or Mexico, and contain deposits which are of great importance. Until the revolution they were both held as the private property of the Russian Crown.



Kluchevskaya Topka (active volcano), Kamchatka.

An antique system of administration retarded the development of lead and zinc mining in both the Altai and Nertchinsk regions and stifled any attempt at industry. A certain amount of silver was produced from rich surface ores during the last century and a half, largely by forced labor.

The Irtysh Corporation—Development of the Altai

In 1912 the Russo-Asiatic Corporation (Ltd.) was formed in London, and an engineer was sent to examine the so-called "cabinet" concessions in the West Altai. He selected as the best of the three largest mines the Ridderski Kope, situated about 50 miles northeast of Ust Kamennogorsk. A lease was obtained from the cabinet of the late Emperor, and the Irtysh Corporation (Ltd.), with a capital of £2,000,000 [$9,733,000], was founded to develop and operate this property. This company also obtained the control of the Ekibastus coal mines, formerly part of the Popof properties west of Pavlodar and connected with the Irtysh River by 50 miles of standard-gauge railway.

In the five years ended in 1917 another railway was constructed by this company connecting the Ridder and Sokolni mines with the Irtysh River; coke ovens and zinc retorts have been erected; a concentration plant has been erected at the mines, and a large amount of development and diamond drilling has been accomplished on the ore deposits. Some of the best mining and metallurgical talent has been employed in developing the process for treatment of the complicated base ores, and all preparations were made for a regular and profitable output of zinc, lead, silver, and gold, which are the four principal recoverable metals present in the ore.

It is estimated by competent engineers that the amount of ore in sight at the Ridder and its neighboring mine, the Sokolni, was sufficient on a conservative basis of cost to net the shareholders £10,000,000 [$48,665,000] in the course of 10 or 12 years after operations were well under way. This was only estimating ore to a moderate depth in two deposits, while over 12 other deposits of the famous "hornstone" were known on the property, where surface indications were of a similar character to these developed mines. Besides this, the coal mines of the company were under competent management and a large amount was spent in preparations for an assured annual production, both for coking purposes in smelting the ores and for filling contracts with the Transsiberian Railway.

It should be noted that the estimated production of the Ridder mine in gold, merely as by-product, amounted to £1,000,000 [$4,866,500] annually, or as much as the average production of the Lenskoie Gold Mining Co., previous to 1915, which produced 25 per cent. of the output of Siberia

Other portions of the Altai zinc lead domain have been under development by the Russian Mining Corporation (Ltd.), of London, and this company in 1916 made copper discoveries on its property that may prove of importance.

Altogether, it is stated that over 4,000 prospects exist in the Altai region showing lead-silver values, only a very small percentage of which have been worked or even looked at during the last three or four decades.

Transbaikal Region—The Coast Region

The Nertchinsk mining region has not been the object of modern development. There are indications that it may yet become the seat of profitable base-metal mining, and it is perhaps fortunate for the future Siberian commonwealth that this great area has been protected as it were from half-hearted private exploitation in the past by the old "cabinet" system under which the convicts only "gophered" out the rich streaks of silver ore near the surface and did not attempt any systematic mining of the important low-grade bodies of lead and zinc.

The coast region, as has been stated, contains the Te-Tu-He zinc mine, which has produced in the last few years a notable quantity of high-grade ore and is not unlikely to be of importance in the future for the production of mixed base ores on a considerable scale. This region has the great advantage of being on the sea coast and therefore is not dependent on the domestic market for its concentrates and spelter produced. Ample deposits of coking coal are also available in the vicinity; therefore should the region of these ores prove extensive it is highly probable that the southern Sikota Aline may become the seat of an important lead and zinc smelting industry.

The Lena Gold Fields

Though gold mining in Siberia has been carried on for centuries, it was not until 1867 that Michael Sibiryakof located the famous Blagovyestchensk mine on the Nakatami, a branch of the Bodaibo Creek, tributary to the Vitim, and is said to have found by chance the deep-lying gravel which has since made this stream and the Bodaibo known wherever placer mining is talked of. The claim mentioned proved the richest gold gravel area of which we have record in the world, 1,000,000 cubic yards of bedrock gravel having produced £3,330,000 [$16,205,000].

Bodaibo Creek, which may be safely estimated to have produced over £40,000,000 [$194,660,000] in 40 miles of length, is too well known to need description. It is but a fraction of the gold-bearing territory of the Vitim and Olekama districts, and although worked out by the present Lenskoie Co., there still remain important reserves of gold to be worked by modern contrivances.

Up to 1914 the methods pursued in mining the drifting ground by the Lenskoie Gold Mining Co were of that archaic description introduced into the Urals by some disciple of Agricola in the time of Catherine the Great. The so-called washing machines were of great historic interest, and one regretted that on account of their bulk it was impossible to transport them to some museum of antiquities in one of the world's great capitals.

Improvement in Methods—Recent Decline in Output.

Fortunately in 1913 Mr. Reuben E. Smith, a mining engineer and specialist on placer mining, was engaged by the company. He at once set to work to improve the methods employed, and in the course of three years, in the face of most intense opposition by the Lenskoie board and many of the local officials of the company, succeeded in greatly reducing the cost and increasing the gold output. The stealing of coarse gold from the drift faces and dumps, which for several years had averaged £300,000 [$1,450,000] annually, was reduced to less than $100,000 in 1915. This was the result of the introduction of all-the-year washing of gold instead of exclusive summer washing. A most ingenious system was developed by Mr. Smith, which allowed the gold to be washed every day of the year, even at the record winter temperature of 1914-15, when on the coldest day 88° below zero Fahrenheit was recorded. By this and other improvements, the introduction of standard Alaska sluices, and the saving of fine gold, that had formerly been lost, the output was gradually raised until in 1915 the record output of this property of £1,800,000 [$8,760,000] in gold was recovered in one year. This, in fact, was the largest output in that year of any gold mine, either quartz or placer, in the world.

Underground improvements, such as the recovery of timber put into the workings, the reduction of man and horse power, and all-round general cost-cutting factors had been introduced, and the Lenskoie property, so far as working cost and production were concerned, was getting fast in line with the world's well-administered mines. But unfortunately the board at Petrograd had engaged the doctor when the patient had nearly expired, and the inevitable fact remained that Bodaibo Creek was worked out. Therefore, irrespective of any political disturbances, the Lenskoie output began to decline in 1916 and has steadily done so since. Although it is reported that the property is still being operated, the 1919 output will probably not reach more than 20 per cent. of the 1915 output.

Other Gold-Producing Areas

New discoveries of drifting gravel are reported from eastern areas of the property remote from Bodaibo. While it is possible that these will lend for a time a new drifting life to the property, a thorough liquidation of the present organization will be necessary before even the richest gravel can be worked at a profit. Ancient poodage rights, imports, etc., exist on many of the best claims, serving to handicap their profitable exploitation even were all the unnecessary overhead charges eliminated.

Outside of the Lenskoie Co., the output of any one mine in the Siberian or Ural territory is insignificant. The aggregate pre-war annual output of Russia was £5,000,000 [$24,000,000] to £6,000,000 [$29,000,000] in gold. Of this sum the Lenskoie Co. annually contributed 25 to 30 per cent. Thus, notwithstanding the fact that Siberia promises to be the world's great gold-producing country of the future, it may be said to be at the turning point, where the alluvial gold is largely worked out and the initiation of quartz mining and the obtaining of gold as a by-product from base metal mines have not commenced.

Future of Siberian Gold Mining

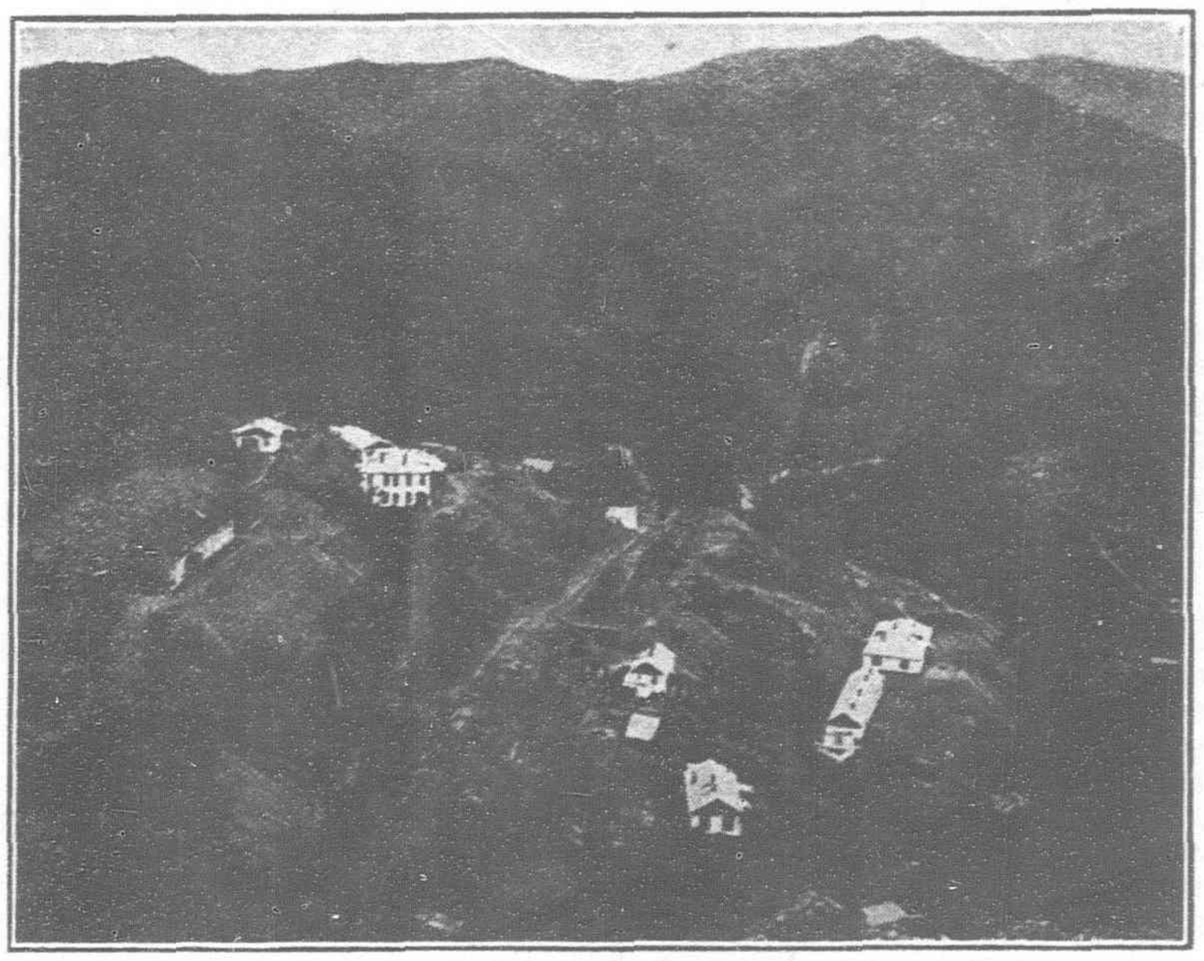
To select the areas where deep mining will be possible and to develop the deposits and select the proper processes for extraction of the metal will require the services of foreign engineers from America, South Africa, and Australia. There is no intrinsic reason why the Siberian output will not eventually equal or even exceed the present annual output of the Transvaal, but the evolution of the industry will be slow, as it has been in other countries.

Gold dredging, which has attained success in other countries, will also have a wide field, but up to the present it has hardly commenced. Out of some 50 dredges that have been installed in various districts in Siberia only about 5 are of any value as machines. Two of these are on the Pacific coast at the property of the Orsk Goldfields (Ltd.) and three are in the Urals at the property of the Nikolai Pavdinsk Co. Gold dredges are significant in increasing notably the gold production of a region when they are installed in multiple units on very large areas, since the recoverable tenor of the gravel on which they operate is generally very low—a few pence per cubic yard.

Platinum Dredges, Output and Deposits

The writer is credibly informed that 27 so-called platinum dredges in the Ural region, mostly on the Iss and Tagil fields, were sunk during the political disturbances. One may say that the loss of these mechanical contrivances is not greatly to be deplored. For the sake of the future of the platinum industry it is to be hoped they will remain scrapped and be replaced by modern dredges.

The entire pre-war platinum output averaged about 150,000 ounces troy annually and, so far as can be gathered, sank to 80,000 ounces in 1917. The Iss field, by far the most important, if worked intensively by dredges for 10 years with an annual output, say, of 300,000 ounces, would probably be exhausted. It is not likely that other platinum fields will be



Zinc Mines of Tetiukha (Tartary Straits).

discovered either in the Urals or elsewhere to take the place of this field when exhausted. It is also possible that certain zones of the Iss dunites may be found workable as a rock source of platinum, since it is known that the platinum occurs in the dunite in recoverable quantity. The same may be said regarding the adjacent less important fields of the Pavdinsk estate and the Tagil.

Borneo Timber Development

The development of the timber resources of British North Borneo upon a larger scale is the object of a combination of interests represented by the sale of the China-Borneo Co., of Hongkong, to Harrisons & Crossfield (Ltd.), of London, which took place December 29. The China-Borneo Co. is a corporation organized under the control of and enjoying a concession from and operating with the backing of the British North Borneo Co., which has held 11,070 shares of the subsidiary company's stock. A similar block of such stocks has been held by Harrisons & Crossfield, a British corporation interested in the development of Borneo's resources.

A considerable trade in hardwood and other timber has been developed in this part of the world by the China-Borneo Co., but the development has not been so great as has been deemed possible and profitable by those concerned and for some time plans have been maturing for the reorganization of the island's timber industry. It has been estimated that the new development will require from $2,500,000 to $3,750,000 gold, and it has been realized that it would be impossible to obtain such an amount of capital in the Far East for such an enterprise at the present time.

It also has been realized that the granting of a new concession to a new company by the British North Borneo Co. would involve a duplication of management expenses and possibly involve friction, while a new company embracing the resources of all interests would have greater authority, credit, and support than two or more concerns would have separately. The China-Borneo Co., therefore has been sold to what amounts to a new organization which is to have a new and extended concession in the colony. The transfer of interests was made for the sum of $828,000 Hongkong currency (which at the present time is substantially the same sum in American currency). This works out at $18 per share—a higher value than the stock ever has been quoted at.

It is understood that the whole change is in line with the plans of the British North Borneo Co. to develop such of its lands in the island as have not as yet been alienated for development. The change promises to affect profoundly the entire timber trade of the Far East and is likely to have some appreciable effect upon the timber and lumber trade of the United States along the Asiatic coast.

Shanghai Tramway Returns

The following is the Traffic Return of the Shanghai Tramways (Foreign Settlement) for the month of April, 1920, and for 4 months ended 30th April, 1920, with figures for the corresponding periods last year :—

	April, 1920.	April, 1919.
Gross Receipts	$192,111.09	$166,176.68
Loss by currency depreciation	50,023.25	41,221.68
Effective Receipts	Mex.$142,087.84	Mex.$124,955.00
Percentage of loss by currency depreciation	27.36	26.02
Car Miles run	391,247	360,420
Passengers Carried	8,560,973	7,546,743
	4 Months ended 30th April, 1920.	4 Months ended 30th April, 1919.
Gross Receipts	$748,090.05	$630,121.76
Loss by currency depreciation	190,670.32	153,252.32
Effective Receipts	Mex.$557,419.73	Mex.$476,869.44
Percentage of loss by currency depreciation	26.82	25.55
Car Miles run	1,555,072	1,398,845
Passengers Carried	33,343,480	28,524,447

Auto Roads in China

If present plans are carried out China's longest modern highway will be completed within six months. It will extend from Peking to Tientsin, a distance of about 80 miles. The first section of this road, from Peking to Tungchow, 13 miles, was constructed in 1917. Through the efforts of the Peking Motor Club it is reported that a loan of $150,000 has been negotiated with the Banque Industrielle de Chine for the construction of a modern road between Tungchow and Tientsin. The remaining section of the new highway is now being surveyed. It will be 20-ft. wide and raised 2-ft. above the existing level. Four bridges will be built, and stations will be erected about 10 miles apart with repair shops and supplies of accessories and fuel. The cost of maintaining the road will be raised from toll fees. Service stations are especially necessary in China because native owners will not take the trouble to care for their machines properly. As long as an engine will run they do not bother with lubrication or stop to clean spark plugs or other parts. Closed cars, mostly coupés, with an occasional limousine, are chiefly in evidence, and red is the predominating color for car bodies. Local traffic rules give automobiles the right of way, and there is apparently no speed limit, except in the Legation Quarter, where it is posted as 15 miles per hour, but rarely observed.

The streets of the Tartar City are macadamized and kept in good condition; steam rollers of British make are used for this purpose. There are good motor roads from Peking to Tongshan, 25 miles north; to Tungchow, 14 miles east; and to the Summer Palace, 12 miles west. It has been suggested that the standing army be reduced and that the demobilized soldiers be employed in the construction of new highways.* If this plan should assume definite form and result in a national road system there would be a large and immediate expansion of the market for motor-cars. At any rate, the completion of the Peking-Tientsin highway will undoubtedly lead to the improvement of other roads, and sales of motor-cars will be greatly stimulated. Automobiles are increasingly popular among the wealthier classes of Chinese, and only the lack of roads limits their sale at present. Native officials and prosperous merchants insist upon the best cars regardless of price.

[*For five years the FAR EASTERN REVIEW has insistently urged this use of China's soldiery.]

Philippine Gutta-Percha

The impression that gutta-percha is not a product of the Philippine Islands is rife among merchants of the United States and European countries, and the matter has recently been brought to the attention of the Philippine Insular officials, who take this opportunity to state that this commodity is one of the exports of the Islands, and, at the present rate of production, the industry bids fair to rival that of the leading gutta-percha producing countries.

The fact that the centre of the gutta-percha market is in Singapore, and that all gutta-percha produced in the Philippines is shipped to that point, whence it is transhipped to the American and European markets, gives rise to this illusion of the merchants.

In 1915 gutta-percha was exported from the Philippine Islands to the amount of 31,650 kilos, valued at P.31,143, and the 1919 custom house figures show that 38,030 kilos were exported in that year, valued at P.36,942. There is a tendency among local dealers to ignore Manila as a possible distributing centre for their product, and much of the gutta-percha produced in the Islands finds its way to Singapore through the smaller ports of the southern Islands, without touching Luzon.

Proposed cable extensions in the United States, coupled with the many and varied uses to which gutta-percha may find application, point to the advisability of establishing a Philippine distributing centre in America and exporting the Philippine product direct to that country.

Motor Vehicle Situation in Japan

The centre of motordom in Japan is Tokyo; cars are usually imported by agents there and distributed thence over the country. About 99 per cent. of the motor vehicles imported during 1918 were of American origin. But there is a settled opinion in Japan that English and French makes of the higher grades are superior to the best class of American cars, and in future the Japanese who do have to consider the price will undoubtedly purchase European models when they are again available. The demand for automobiles was at its height in Japan when the armistice was signed; dealers had placed large orders in the United States, and these were mostly filled following the armistice. But, coincident with the business depression in Japan, lasting from November, 1918, to March, 1919, the demand for automobiles practically ceased. This left dealers heavily stocked, and some of them for a time were unable to pay the customs duties on their orders. The cars accumulated at the customs warehouse as a result, and a few were even sold by the authorities for charges. The remainder were gradually absorbed, however, or were reexported to Java, Shanghai, Straits Settlements, and other markets of the Far East. The market recovered, and in the fall of 1919 automobiles were being imported from the United States at the rate of about 150 per month.

Mention has been made of the bounties granted by the Japanese Government to encourage the use of motor trucks. In spite of liberal concessions, motor trucks have not been increasing very rapidly outside of Tokyo and Nagoya, nor can they come into very general use until roads and bridges are put into better condition. But the Japanese are fully aware of the advantages of motor transport, the question of roads is attracting wide attention, and it is probable that the next few years will see great improvements in road construction in Japan.

Accurate statistics are not available as to the number of motor cycles in Japan. But based upon the approximate number in the Kobe district, the total for the Empire may be placed at somewhat more than 2,000. The type in use are mostly of British and Japanese manufacture. American motor cycles are usually too large and heavy for the Japanese to use; and the high-speed types popular in America are not practicable for the road conditions in Japan, which rarely permit a speed of more than 20 miles an hour. The favorite motor cycle in Japan is a low-priced, one-cylinder machine with a two-speed gear, clutch, belt drive to the rear wheel, cable controls, and magneto ignition.

Because of its narrow roads Japan would appear to offer a better market for motor cycles than for automobiles. But such is not the case. One reason is that very few Japanese take up motor cycling as a sport; and this mode of travel is not sufficiently dignified to appeal to the wealthy classes. The purchasing power of the vast majority of the people is too low to admit of their possessing even this means of locomotion; hence the sale of motor cycles is restricted to the comparatively small class of moderately well-to-do natives and foreigners.

Japanese have 300 Million Invested in U.S.

The Japanese and the government of Japan have nearly $300,000,000 invested in the United States, says the Wall Street Journal. This represents the accumulation of balances built up throughout the period of the war, with the exception of some gold that has been shipped and funds invested in allied loans from time to time. The $300,000,000 is a call which Japan has on our gold. The Japanese government has invested a large part of its balances in United States certificates, which are payable in gold, if demanded.

It is stated, however, that there is no intention on the part of the Japanese at present to take gold from this country, or, in fact, to do anything that would have a detrimental effect upon the local credit situation. Gold will only be taken, in realizing upon these balances, as a last resort.

Japan is now making use of American credits to finance her purchases of cotton and other commodities from this country. Her purchases of cotton in this market are quite heavy at this time, and the movement will continue until about February. As an instance of this financing, the Yokohama Specie Bank at the beginning of this week invested $3,000,000 in ninety-day cotton bills going forward to Japan. By investing in Japanese bills in this way, the exchange rate is stabilized. The exchange rate on Japan is now $50.62 per 100 yen, as against the parity of $49.84. It is actually above the gold shipping point, which just now is $50.50. Before the war, when freight and insurance charges were less, the specie point was about $50.25.

The investment of Japanese balances here in this way will continue so long as the supply of bills lasts. It will relieve the American banks from financing these exports, and to that extent will help the local credit situation.

The Japanese government at one time had as much as $150,000,000 invested in United States Treasury certificates of indebtedness. It has now $88,000,000 in the loan certificates maturing next year. Of this amount $83,000,000 is in the series C-1920, maturing February 2, and $5,000,000 in series B-1920, maturing January 15. On December 15 $58,000,000 of tax certificates matured, and practically all were re-invested in the new certificates offered for subscription.

Whether the Japanese government will call in what is left of its balance when the certificates run out by importing gold will depend upon monetary conditions existing at that time. Japan will probably be able to keep exchange here at the gold shipping point by reason of financing her merchandise imports.

There is no intention, it is declared, of placing the Japanese balances at the disposal of the European allies, and thus help stabilize sterling and other allied exchanges. Even the existing large balances would be inadequate for that purpose.

Foreign Firm in Mongolia

Mr. I. B. Shefts, of the Andersen, Meyer & Co, Urga branch, has just returned from a seven months' itinerary through Mongolia, and brings with him a most encouraging report of conditions in China's great undeveloped north-west, says the "North China Star."

Great changes for the better are coming over the country since the cancellation of autonomy and the taking over of government by the Chinese, says Mr. Shefts. A new attitude of encouragement of foreign trade is noticeable. Many foreigners are entering the country, particularly Scandinavians and Americans.

Andersen, Meyer & Co. have established themselves in Mongolia by opening branches in Urga and very recently in Uliasutai, 800 miles from Urga and 2,000 from Kalgan. They operate their own motor-car routes and camel caravans over the vast plains. From Kalgan to Urga is 4½ to six days' travel by motor-car and a month by camel. The road is good with the exception of the high pass about fifty miles out of Kalgan. Travellers on the road pass, at frequent intervals, stalled motor-cars.

The political situation, says Mr. Shefts, is entirely calm and order prevails, although detachments of Chinese troops are daily marching from Urga for Kiatka to protect the frontier. Urga is a fine city with a large Chinese merchant population and a Russian community of about 2,000 which is self-policing.

Apparatus of the Marconi Co. has already arrived at Urga, states Mr. Shefts, for the new wireless system reaching from Urga to Uliasutai, Kaobdo and the Tibetan border. Telegraph communications are now clear from Urga direct to Kiatka, Petrograd and Moscow.

The Mongolian police have been officered by Chinese of the North-western Defence Army. The post-offices and all government offices have been taken over by General Li, the assistant of Hsu Shu-tseng. Chinese passports needed. All foreigners now entering Mongolia must be provided with Chinese passports, and negligence in this respect has got travellers into considerable difficulty. The great present need, says Mr. Shefts, is that Urga be made an open port, which it is not at present. It is expected that this matter will have the attention of the Chinese government shortly.

Port and Railway Schemes for South China

Dr. Sun Yat Sen's Third Program for the International Development of China—*Continued from April Issue*

The First Program for the International Development of China as devised by Dr. Sun Yat-sen was published in the FAR EASTERN REVIEW of June, 1919, and embraced: (1) the construction of a great Northern port on the Gulf of Pechihli; (2) the building of a system of railways from the great Northern port to the North-Western extremity of China; (3) the colonization of Mongolia and Turkestan; (4) the construction of canals to connect the inland waterway systems of North and Central China with the great Northern port; and (5) the development of the iron and coal fields in Shansi and the construction of an iron and steel works. In the FAR EASTERN REVIEW of August, 1919, the Second Program was published and comprised (1) a great Eastern port; (2) the regulation of the Yangtze channels and embankments; (3) the construction of river ports; (4) the improvement of existing canals and waterways in connection with the Yangtze, and (5) the establishment of large cement works.

By Dr. Sun Yat-sen, ex-President of China.

Part III.—The Construction of the Southwestern Railway System of China

THE southwestern part of China comprises Szechuan, the largest and richest province of China Proper, Yunnan, the second largest province, Kwangsi and Kweichow which are rich in mineral resources, and a part of Hunan and Kwangtung. It has an area of 600,000 square miles, and a population of over 100,000,000. This large and populous part of China is almost untouched by railways, except a French line of narrow gauge from Laokay to Yunnanfu, covering a distance of 290 miles.

There are great possibilities for railway development in this part of the country. A network of lines should radiate fan-like from Canton as pivot to connect every important city and rich mineral field with the Great Southern Port. The construction of railways in this part of China is not only needed for the development of Canton but also is essential for the prosperity of all the southwestern provinces. With the construction of railways rich mines of various kinds could be developed and cities and towns could be built along the lines. Developed lands are still very cheap and undeveloped lands and those with mining possibilities cost almost next to nothing even though not state owned. So if all the future city sites and mining lands be taken up by the government before railway construction is started, the profit would be enormous. Thus no matter how large a sum is invested in railway construction, the payment of its interest and principal will be assured. Besides, the development of Canton as a world port is entirely dependent upon this system of railways. If there be no such network of railways traversing the length and breadth of the southwestern section of China, Canton could not be developed up to our expectations.

The southwestern section of China is very mountainous, except the Canton and Chengtu plains, which have an area of from 3,000 to 4,000 square miles each. The rest of the country is made up almost entirely of hills and valleys with more or less open space here and there. The mountains in the eastern part of this section are seldom over 3,000-ft. high but those near the Tibetan frontier generally have an altitude of 10,000-ft. or more. The engineering difficulties in building these railways are much greater than those of the northwestern plain. Many tunnels and loops will have to be constructed and so the construction expenses of the railway per mile will be greater than in other parts of China.

With Canton as the terminus of this system of railroads, I propose that the following lines be constructed :—

(*a*) The Canton-Chungking line viâ Hunan.
(*b*) The Canton-Chungking line viâ Hunan and Kweichow.
(*c*) The Canton-Chêngtu line viâ Kweilin and Luchow.
(*d*) The Canton-Chêngtu line viâ Wuchow and Suifu.
(*e*) The Canton-Yunnanfu-Tali-Tengyueh line ending at the Burma border.
(*f*) The Canton-Szemao line.
(*g*) The Canton-Yamchow line ending at Tunghing, on the Annam border.

(*a*) The Canton-Chungking line viâ Hunan. This line will start from Canton and follow the same direction as the Canton-Hankow line as far as the junction of the Linkiang with the North River. From that point the railroad turns in to the valley of Linkiang, and follow the course of the river above the city of Linchow. There it crosses the watershed between the Linkiang and the Taokiang and proceeds to Taochow, Hunan. Thence it follows the Taokiang to Yungchow, Paoking, Sinhwa and Shenchow, and up to Peiho across the boundary of Hunan into Szechuan by Yuyang. Then it follows the Wukiang Valley to Fowchow on the Yangtze. At that point the railroad should cross the Yangtze to the left bank then go up to Changshow and Kiangpei and cross the Kialing Kiang to Chungking. This railway which has a total length of about 900 miles passes through a rich mineral and agricultural country. In the Linchow district north of Kwangtung, rich coal, antimony, and wolfram deposits are found; in southwestern Hunan tin, antimony, coal, iron, copper, and silver; and at Yuyang, east of Szechwan, antimony, and quicksilver. Among agricultural products found along this line we may mention sugar, groundnuts, hemp, tung oil, tea, cotton, tobacco, silk, grains, etc. There is also an abundance of timber, bamboo and various kinds of forest products.

(*b*) The Canton-Chungking line viâ Hunan and Kweichow. This line is about 800 miles in length, but as it runs in the same track with line (*a*) from Canton to Taochow, a distance of about 250 miles, it leaves only 550 miles to be accounted for. This line, therefore, actually begins at Taochow, Hunan, and goes through the northeastern corner of Kwangsi passing by Chuanchow, and then through the southwestern corner of Hunan passing by Chengpu and Tsingchow. Thence it enters into Kweichow by Sankiang and Tsingkiang and crosses a range of hill to Chengyuan. From Chengyuan this line has to cross the watershed between Yuan Kiang and Wukiang to Tsunyi. From Tsunyi it will follow the trade route which leads to Kikiang and Chungking. This railway will also pass through rich mineral and timber districts.

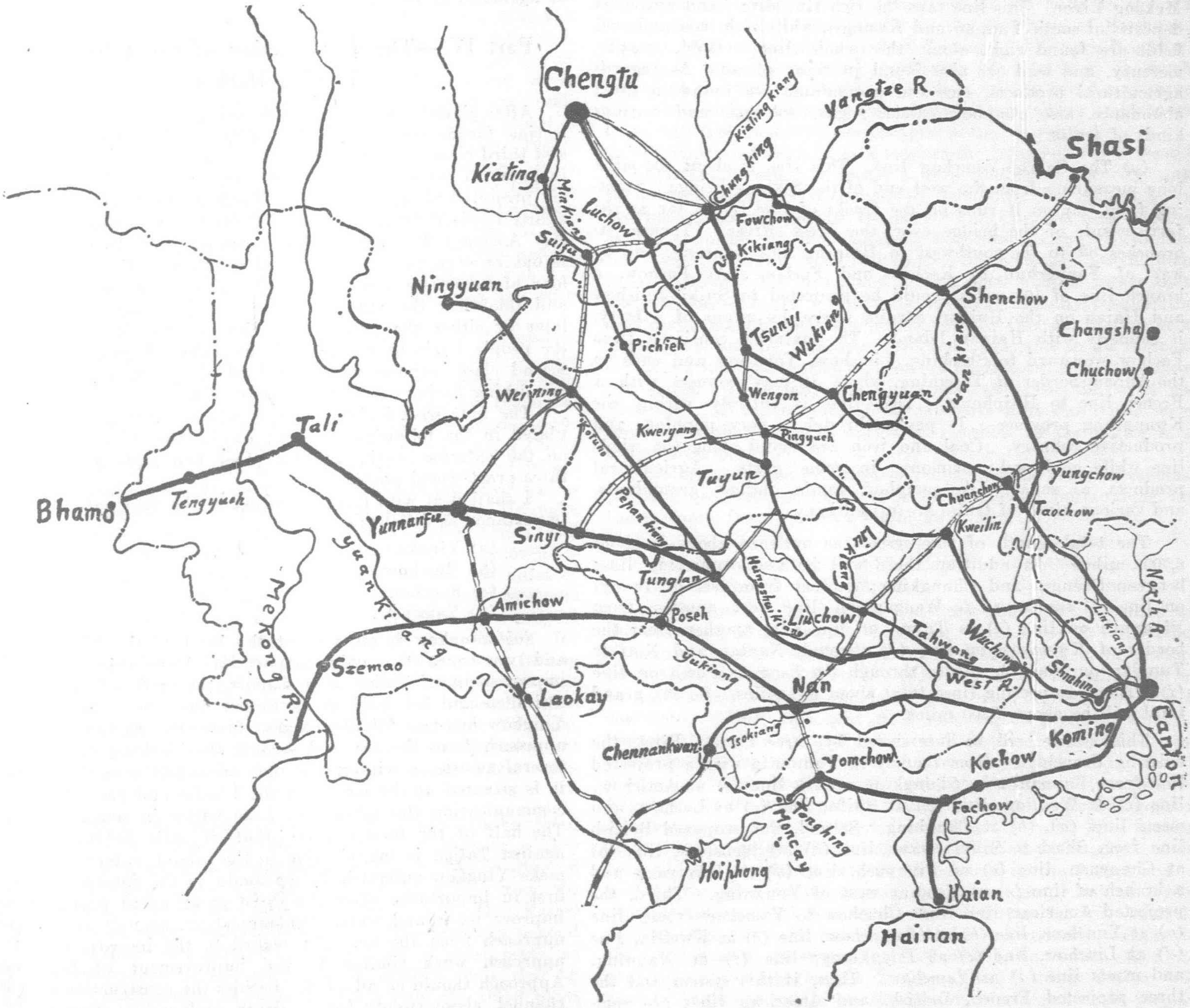
(*c*) The Canton-Chêngtu line viâ Kweilin and Luchow. This line is about 1,000 miles long. It runs from Canton directly west to Samshui, where it crosses the North River to the mouth of Suikong. Then, it ascends the valley of the same name to Szewui and Kwongning. Next, it enters into Kwangsi at Waisap, thence to Hohsien and Pinglo. From there it follows the course of the Kweikiang up to Kweilin. Thus the rich iron and coal fields that lie between these two provincial capitals, Canton and Kweilin, will be tapped. From Kweilin the road turns west to Yungning and then proceeds to follow the Liukiang valley into Kweichow province at Kuchow. From Kuchow it goes to Tukiang and Pachai and following the same valley it crosses a range of

hills into Pingyueh, thence it goes across the Yuankiang watershed into the Wukiang valley at Wengan and Yosejen. From Yosejen it follows the trade route through Luipien hills to Jenhwai, Chishui and Nachi. Then it crosses the Yangtzekiang to Luchow. From Luchow, it runs through Lungchang, Neikiang, Tzechow, Tseyang and Kienchow to Chêngtu. The last part of the line traverses very rich and populous districts of the famous Red Basin of Szechwan province. The middle portion of this line between Kweilin and Luchow lies in a very rich mineral country which possesses great possibilities for further development. This line will open up a thinly populated part for the crowded districts at both ends of the line.

(*d*) The Canton-Chêngtu line viâ Wuchow and Suifu. This line is about 1,200 miles in distance. It commences at the west end of the Samshui bridge which crosses the North River at that point for line (*c*), and following the left bank of the West River enters the Shiuhing Gorge to the Shiuhing city. It passes Takhing, Wuchow and Tahwang along the same bank. While the river here turns southwestwards the line turns northwestwards to Siangchow and then crosses Liukiang to Liuchow and Kingyuan. Then it goes to Szegenhsien and across the Kwangsi and Kweichow border to Tushan and Tuyun. From Tuyun the line turns more westerly to Kweiyang, the capital of Kweichow Province. Next, it proceeds to Kiensi and Tating and then leaving the Kweichow border at Pichieh it enters Yunnan at Chenhiung. Turning northward to Lohsintu and crossing the Szechwan border at that point, it proceeds to Suifu. From Suifu the road follows the course of the Minkiang, passes by Kiating and enters the Chêngtu plain to Chêngtu, capital of Szechwan. This line runs from one densely populated district to another and passes through a wide strip of thinly populated and undeveloped country in the middle. Along its course many rich iron and coal fields, silver, tin, antimony and other valuable metal deposits are found.

(*e*) The Canton-Yunnan-Tali-Tengyueh line. This line is about 1,300 miles in length from Canton to the Burma border at Tengyueh. The first 300 miles of the line from Canton to Tahwang will be the same as line (*d*). From the Tahwang junction this line branches off to Wusuan and following in a general way the course of the Hungshui Kiang passes through Tsien Kiang and Tunglan. Then it cuts across the southwestern corner of Kweichow province passing by Sinyihsien and thence enters Yunnan province at Loping and by way of Luliang to Yunnanfu, the capital of the province. From Yunnanfu this line runs through Tsuyung to Tali, then turns southwestwards to Yungchang and Tengyueh ending at the Burma border.

At Tunglan, near the Kweichow border in Kwangsi, a branch line of about 400 miles should be projected. This line should follow the Pepan Kiang valley, up to Kotuho, and Weining. Thence it enters Yunnan at Chaotung, and crosses the Yangtze Kiang at Hokeow, where it enters Szechwan. Crossing the Taliang mountain, it goes to Ningyuan. This branch line taps the famous copper field between Chaotung and Ningyuan, the richest of its kind in China.



MAP VI.

The main line running through the length of Kwangsi and Yunnan from east to west, will be of international importance, for at the frontier it will join the Rangoon Bhamo line of the Burmese Railway System. It will be the shortest road from India to China. It will bring the two populous countries nearer to each other than now. By the new way the journey can be made in a few days, whereas by the present sea-route it takes as many weeks.

(*f*) The Canton-Szemae line. This line to the border of Burma is about 1,100 miles long. It starts from south of Canton, passes Fatshan, Kunshan, and crosses the West River from Taipinghü to Samchowhü. Thence it proceeds to Koming, Sinhing, and Loting. After passing Loting it crosses the Kwangsi border at Pingho, and proceeds to Junghsien and then westward, crossing the Yukiang branch of the West River, to Kweihsien. It runs north of Yukiang to Nanning. At Nanning a branch line of 120 miles should be projected. Following the course of the Tsokiang it goes to Lungchow where it turns southward to Chennankwan on the Tongking border to join the French line at that point. The main line from Nanning proceeds in the same course as the upper Yukiang to Poseh. Then it crosses the border into Yunnan at Poyai, and by way of Pamen, Koukan, Tungtu and Putsitang to Amichow, where it crosses the French Laokay-Yunnan line. From Amichow it proceeds to Linanfu, Shihping, and Yuankiang where it crosses the river of the same name. Thence it passes through Talang, Puerhfu and Szemao and finally ends at the border of Burma near the Mekong River. This line taps the rich tin, silver, and antimony deposits of south Yunnan and Kwangsi, while rich iron and coal fields are found right along the whole line. Gold, copper, mercury, and lead are also found in many places. As regards agricultural products, rice and groundnuts are found in great abundance, also camphor, cassia, sugar, tobacco, and various kinds of fruits.

(*g*) The Canton-Yamchow line. This line is about 400 miles long measuring from the west end of the Sikiang bridge. Starting from Canton it runs on the tracks of line (*f*) as far as the farther side of the bridge over the West River. Thence it branches off to the southwest to Hoiping and Yanping, and by way of Yeungchun to Kochow and Fachow. At Fachow, a branch line of 100 miles should be projected to Suiki, Luichow and Haian on the Hainan Straits where, by means of a ferry, it connects with Hainan Island. The mainline continues from Fachow westward to Sheshing, Limchow, Yamchow and ends on the Annam border at Tunghing, where it may connect with a French line to Haiphong. This line is entirely within the Kwangtung province. It passes through a very populous and productive country. Coal and iron are found along the whole line while gold and antimony, in some parts. Agricultural products, as sugar, silk, camphor, ramie, indigo, groundnuts, and various kinds of fruits are raised here.

The total length of this system as outlined above is about 6,700 miles. In addition there will be two connecting lines between Chêngtu and Chungking; another from east of Tsunyi on line (*b*) southward to Wengan on line (*c*); another from Pingyueh on line (*c*) to Tuyun on line (*d*); another from the border of Kweichow on line (*d*) through Nantan and Noti to Tunglan on line (*e*), thence through Szecheng to Poseh on line (*f*). These connecting lines total about 600 miles. So the grand total will be about 7,300 miles.

This system will be intersected by three lines. First, the existing French line from Laokay to Yunnanfu with a projected line from Yunnanfu to Chungking crosses line (*f*) at Amichow, line (*e*) at Weining, line (*d*) at Suifu, line (*c*) at Luchow, and meets lines (*a*), (*b*) at Chunking. Second, the projected British line from Shasi to Sinyi crosses line (*a*) at Shenchow, line (*b*) at Chenyuen, line (*c*) at Pingyueh, line (*d*) at Kweiyang and a branch of line (*e*) at a point west of Yungning. Third, the projected American line from Chuchow to Yamchow crosses line (*a*) at Yunchow, line (*b*) at Chuanchow, line (*c*) at Kweilin, line (*d*) at Liuchow, line (*e*) at Tsienkiang, line (*f*) at Nanning, and meets line (*g*) at Yamchow. Thus, if this system and the three projected French, British, and American lines are completed, Southwestern China would be well provided with railway communications. See Map VI.

All these lines will run through the length and breadth of a vast mineral country, in which most of the essential and valuable metals of the world are found. There is no place in the world which possesses as here so many varieties of rare metals, such as wolfram, tin, antimony, silver, gold, and platinum and at the same time so richly provided with the common but essential metals, such as copper, lead and iron. Furthermore, almost every district in this region is abundantly provided with coal, so much so that there is a common saying: "Mu mei pu lih cheng," that is, "Nobody would build a city where there is no coal underneath." The idea was that in case of a siege those within the city might obtain fuel under the ground. In Szechwan, Petroleum and natural gas are also found in abundance.

Thus, we see that this Southwestern Railway System for the development of mineral resources in the mountainous regions of Southwestern China is just as important as the Northwestern Railway System is for the development of agricultural resources in the vast prairies of Mongolia and Turkestan. These railway systems are a necessity to the Chinese people and a very profitable undertaking to foreign capitalists. They are of about equal length, *viz.*— about 7.000 miles. The cost per mile of the Southwestern system will be at least twice that of the Northwestern System, but the remuneration from the development of mineral resources will be many times that from the development of agricultural resource.

Part IV.—The Construction of Coast Ports and Fishing Harbors

After planning the three world ports on the coast of China, it is time for me to go on and deal with the development of second and third class seaports and fishing harbors along the whole coast in order to complete a system of seaports for China. Recently, my projected plan of the Great Northern Port was so enthusiastically received by the people of Chili Province that the Provincial Assembly has approved the project and decided to carry it out at once as a provincial undertaking. For this object, a loan of $40,000,000 has been voted. This is an encouraging sign and doubtless the other projects will be taken up sooner or later by either the provinces or the Central Government, when the people begin to realize their necessity. I propose that four second class seaports and nine-third class seaports and numerous fishing harbors should be constructed.

The four second class seaports will be arranged so as to be placed in the following manner: one on the extreme north, one on the extreme south, and the other two midway between the three great world ports.

I shall deal with them according to the order of their future importance as follows:—

(*a*) Yingkow.
(*b*) Haichow.
(*c*) Foochow.
(*d*) Yamchow.

(*a*) Yingkow is situated at the head of the Liaotung Gulf and was once the only seaport of Manchuria. Since the improvement of Talien as a seaport, the trade of Yingkow has dwindled and lost half of its former business. As a seaport, Yingkow has two disadvantages, first, the shallowness of its approach from the sea and second, the blocking up by ice for several months in winter. Its only advantage over Talien is that it is situated at the mouth of the Liaoho and has inland water communication throughout the Liao valley in south Manchuria. The half of the former trade that it still holds at present against Talien is entirely due to the inland water facility. To make Yingkow outmatch Talien again in the future and become first in importance after the three great world ports, we must improve its inland water communication, as well as deepen its approach from the sea. In regard to the improvement of the approach work similar to the improvement of the Canton Approach should be adopted. Besides the construction of a deep channel, about twenty feet in depth, reclamation work should be

carried out at the same time. For, the shallow and extensive swamp at the head of the Liaotung Gulf could be turned into rice-producing land from which great profit could be derived. Regarding the inland water communication, not only the water system in the Liao valley but also the Sungari and the Amur Systems have to be improved. The most important work is the construction of a canal to connect these systems and this I shall now discuss in the next paragraph.

The Liaoho-Sungari Canal is the most important factor in the future prosperity of Yingkow. It is by this canal only that this port can be made the most important of the second class seaports in China and further the vast forest lands, the virgin soil and the rich mineral resources of North Manchuria can be connected by water communication with Yingkow. So this canal is all important for Yingkow, without which Yingkow as a seaport could at most hold her present position, a town of 60,000 to 70,000 inhabitants and an annual trade of $30,000,000 to $40,000,000 only and could never gain a place as the first of the second class seaports in China. This canal can be cut either south of Hwaiteh in a line parallel to the South Manchurian Railway between Fan Kia Tun and Sze Tung Shan, a distance of less than ten miles, or, north of Hwaiteh in a line between Tsing-shan-pao and Kaw-shan-tun, a distance of about fifteen miles. In the former case the canal is shorter but it makes the waterway as a whole longer, while in the latter case, the canal is about twice as long but it makes the waterway as a whole shorter between the two systems. In either line, there are no impassable physical obstacles. Both lines are on the plain but the elevation of the one may be higher than that of the other, which is the only factor that will determine the choice between the two. If this canal is constructed, then the rich provinces of Kirin and Heilungkiang and a portion of Outer Mongolia will be brought within direct water communication with China Proper. At present, all water traffic has to go by way of the Russian Lower Amur, then round a great detour of the Japan Sea before reaching China Proper. This canal will not only be a great necessity to Yingkow as a seaport, but will also have a great bearing on the whole Chinese nation economically and politically. With the Liaoho-Sungari Canal completed Yingkow will be the grand terminus of the inland waterway system of all Manchuria and North-eastern Mongolia; and with the approach from the sea deepened it will also be a seaport next in importance only to the three first class world ports.

(*b*) Haichow is situated on the eastern edge of the central plain of China. This plain is one of the most extensive and fertile areas on earth. As a seaport, Haichow is midway between the two great world ports along the coast line, namely the Great Northern and the Great Eastern Ports. It has been made as the terminus of the Hailan railway, the trunk line of central China from east to west. Haichow also possesses the facility of island water communication. If the Grand Canal and the other waterway systems are improved, it will be connected with the Hoangho Valley in North China, the Yangtze Valley in Central China, and the Sikiang Valley in South China. Its deep sea approach is comparatively good, being the only spot along the 250 miles of the North Kiangsu coast that could be reached by ocean steamers to within a few miles of the shore. To make Haichow a seaport for 20-ft. draft vessels, the approach has to be dredged for many miles from the mouth of the river before the four fathom line could be reached. Although possessing better advantages than Yingkow, in being ice free, Haichow, as a second class seaport, has to be content to take a second place after Yingkow, because she does not have as vast a hinterland as Yingkow, nor such a monopolistic position in regard to inland water communication.

(*c*) Foochow, the capital of Fukien Province, ranks third among our second class seaports. Foochow is already a very large city, its inhabitants being nearly a million. It is situated at the lower reach of the Min River, about 30 miles from the sea. The hinterland of this port is confined to the Min Valley with an area of about 30,000 square miles. The territory beyond this valley will be commanded by other coast or river ports, so the area commanded by this port is much smaller than that by Haichow. Consequently, it could be given only the third place in the category of second class seaports. The Foochow approach from the Outer Bar to Kinpei Entrance is very shallow. After this Entrance is passed, the river is confined on both sides by high hills and becomes narrow and deep right up to Pagoda Anchorage.

I propose that a new port should be constructed at the lower part of Nantai Island. For here land is cheap and there will be plenty of room for modern improvement. A locked basin for shipping could be constructed at the lower point of Nantai Island, just above Pagoda Anchorage. The left branch of the Min River above Foochow City should be blocked up so as to concentrate the current to flush the harbor at the south side of Nantai. The blocked-up channel on the north side of that island should be left to be reclaimed by natural process or may be used as a tidal basin to flush the channel below Pagoda Anchorage, if it is found necessary. The upper Min River must be improved as far as possible for inland water traffic. Its lower reach from Pagoda Anchorage to the sea must be trained and regulated to secure a through channel of 30-ft. or more to the open sea. Thus Foochow could also be made a calling port for ocean liners that ply between the world ports.

(*d*) Yamchow is situated at the head of Tongking Gulf in the extreme south of the China Coast. This city is about 400 miles west of Canton—the Great Southern Port. All the districts lying west of Yamchow will find their way to the sea by this port 400 miles shorter than by Canton. As sea transportation is commonly known to be twenty times cheaper than rail transportation, the shortening of a distance of 400 miles to the sea means a great deal economically to the provinces of Szechuan, Yunnan, Kweichow, and a part of Kwangsi. Although Nanning, an inland water port, lying northwest of Yamchow, is much nearer to the hinterland than Yamchow, yet it could not serve this hinterland as a seaport. So all the direct import and export trade will find Yamchow the cheapest shipping stage.

To improve Yamchow as a seaport the Lungmen River should be regulated in order to secure a deep channel to the city, and the estuary should be deepened by dredging and training to provide a good approach to the port. This port has been selected as the terminus of the Changsha-Yamchow Railway (Chu-Kin line) which will run from Hunan through Kwangsi into Kwangtung. Although the hinterland of this port is much larger than that of Foochow, yet I still rank it after that city because the area commanded by it is also commanded by Canton, the southern world port, and by Nanning, the river port, and so all internal as well as indirect import and export trade must go to the other two ports. It is only the direct foreign trade that will use Yamchow. Thus, in spite of its extensive hinterland it is very improbable that it could outmatch Foochow in the future as a second-class port.

Besides the three great world ports, and the four second-class ports, I propose to construct nine third-class ports along the China coast, from north to south, as follows:—

(*a*) Hulutao	(*d*) Ningpo	(*g*) Swatow
(*b*) Hoangho Port	(*e*) Wenchow	(*h*) Tienpak
(*c*) Chefoo	(*f*) Amoy	(*i*) Hoihou

(*a*) Hulutao is an ice-free and deep-water port, situated on the west side of the head of Liaotung Gulf, about 60 miles from Yingkow. As a winter port for Manchuria, it is in a more advantageous position than Talien for it is about 200 miles shorter by rail to the sea than the latter and is on the edge of a rich coal field. When this coal field and the surrounding mineral resources are developed, Hulutao will become the first of the third-class ports and a good outlet for Jehol and Eastern Mongolia. This port may be projected as an alternative to Yingkow, as the sole port of Manchuria and Eastern Mongolia, if a canal could be constructed to connect it with the Liaoho. It is only by inland water communication that Yingkow could be made the important port of Manchuria in the future and it will be the same in the case of Hulutao. So if inland water communication could be secured for Hulutao it will entirely displace Yingkow. If it is found to be economically cheaper in the long run to construct a Hulutao-Liaoho Canal than to construct a deep harbor at Yingkow, the Hulutao harbor will have to be placed on the northwest side of the peninsula instead

of on the southwest as at present projected. For the present site has not enough room for anchorage without building an extensive breakwater into the deep sea, which will be a very expensive work. Furthermore, there would not be room enough for city planning on the narrow peninsula, whereas on the other side, the city could be built on the mainland with unlimited space for its development.

I suggest that a sea wall be built from the northern point of Lienshanwan to the northern point of Hulutao to close up the Lienshan Bay and make it into a closed harbor, and an entrance be opened in the neck of Hulutao to the south side where deep water is found. This closed harbor will be over 10 square miles in extent but only some parts need to be dredged to the required depth at present. On the north side of the harbor, another entrance into the neighboring bay should be left open between the sea wall and the shore, and another breakwater should be built across the next bay. From there, a canal should be constructed either by cutting into the shore or by building a wall parallel with the coast line until it reaches the lowland from where a canal should be cut to connect with the Liaoho. If a canal is thus constructed for Hulutao, then it will at once take the place of Yingkow and become the first of the second-class ports.

(*b*) The Hoangho Port will be situated at the estuary of the Hoanghe on the southern side of the Gulf of Pechili, about 80 miles from our Great Northern Port. When the Hoangho regulation is completed its estuary will be approachable by ocean steamers, and a seaport will naturally spring up there. As it commands a considerable part of the northern plain in the provinces of Shantung, Chili, and Honan and possesses the facility of inland water communication, this port is bound to become an important third-class port.

(*c*) Chefoo is an old treaty port situated on the northern side of the Shantung Peninsula. Once it was the only ice-free port in the whole of North China. Since the development of Talien in the north and the development of Tsingtao in the south its trade has dwindled considerably. As a seaport, it will undoubtedly hold its own when the railroads in the Shantung Peninsula are developed, and the artificial harbor is completed.

(*d*) Ningpo is also an old treaty port, situated on a small river, the Yungkiang, in the eastern part of Chêkiang province. It has a good approach, deep water reaching right up to the estuary of the river. The harbor can be easily improved by simply training and straightening two bends along its course up to the city. Ningpo commands a very small but rich hinterland. Its people are very enterprising, and are famed for their workmanship and handicrafts second only to those of Canton. Thus Ningpo is bound to become a manufacturing city when China is industrially developed. But owing to the proximity of the Great Eastern Port, Ningpo will not likely have much import and export trade directly with foreign countries. Most of its trade will be carried on with the Great Eastern Port. So a moderate harbor for local and coast-wise traffic will be quite sufficient for Ningpo.

(*e*) Wenchow is situated near the mouth of the Wukiang in south Chekiang. This seaport has a wider hinterland than Ningpo, its surrounding districts being very productive. If railroads are developed it will undoubtedly command considerable local trade. At present the harbor is very shallow, unapproachable by even moderate-sized coastal steamers. I suggest that a new harbor at Panshiwei, north of Wenchow Island, be constructed. For this purpose, a dyke should be built between the northern bank and the head of Wenchow Island to block up the river entirely on the northern side of that island leaving only a lock entrance. The Wukiang should be led through the channel on the south side of the island for the purpose of reclaiming the vast expanse of the near-by shallows as well as for draining the upper stream. The approach from the southern side of Hutau Island to the port should be dredged. On the right side of the approach, a wall should be built in the shallow between Wenchow Island and Miau Island and in the shallows between Miau Island and Sanpam Island so as to form a continual wall to prevent the silt of Wukiang from entering into the approach. Thus a permanent deep channel will be secured for the new port of Wenchow.

(*f*) Amoy, an old treaty port, is situated on the island of Siming. It has a great, deep, and fine harbor, commanding a considerable hinterland in southern Fukien and Kiangsi, very rich in coal and iron deposits. This port carries on a busy trade with the Malay Archipelago and the Southeastern Asian Peninsula. Most of the Chinese residents in the southern islands, Annam, Burma, Siam, and the Malay States are from the neighborhood of Amoy. So the passenger traffic between Amoy and the southern colonies is very great. If railways are developed to tap the rich iron and coal fields in the hinterland, Amoy is bound to develop into a much larger seaport than it is at present. I suggest that a modern port be constructed on the west side of the harbor to act as an outlet for the rich mineral fields of southern Fukien and Kiangsi. This port should be equipped with modern plants in order to connect land and sea transportation together.

(*g*) Swatow is situated at the mouth of the Hankiang, at the extreme east of Kwangtung. In relation to emigration, Swatow is much similar to Amoy, for it also supplies a great number of colonists to southeastern Asia and the Malay Archipelago. So its passenger traffic with the south is just as busy as Amoy. As a seaport Swatow is far inferior to Amoy, on account of its shallow approach. But in regard to inland water communication, Swatow is in a better position as the Hankiang is navigable many hundred miles inland by shallow crafts. The country around Swatow is very productive agriculturally, being second only to the Canton Delta along the southern sea board. In the upper reaches of the Hankiang there are very rich iron and coal deposits. The approach to the port of Swatow can be improved easily by a little training and dredging, thus making it a fine local port.

(*h*) Tienpak is situated at a point on the coast of Kwangtung province between the estuary of the West River and the island of Hainan. Its surrounding districts are rich in agricultural products and mineral deposits. So a shipping port in this part is quite necessary. Tienpak can be made into a fine harbor by entirely walling in the bay from its west side and by opening a new entrance into the deep water in the neck of the peninsula southeast of the bay. Thus a good approach could be secured. The harbor is very wide but only a part need be dredged for large vessels and the rest of the space could be used by fishing boats and other shallow crafts.

(*i*) Hoihou is situated on the north side of Hainan Island on the strait of the same name, opposite Haian on the Luichow Peninsula. Hoihou is a treaty port, similar to Amoy and Swatow, supplying a great number of colonists to the south; Hainan is a very rich but undeveloped island. Only the land along the coast is cultivated, the central part being still covered by thick forests and inhabited by aborigines, and it is very rich in mineral deposits. When the whole island is fully developed, the port of Hoihou will be a busy harbor for export and import traffic. The harbor of Hoihou is very shallow, and so even small vessels have to anchor miles away in the roadstead outside. This is very inconvenient for passengers and cargoes, so the improvement of the Hoihou harbor is a necessity. Furthermore this harbor will be the ferry point between this island and the mainland for railway traffic when the railway systems of the mainland and the island are completed.

Fishing Harbors

As regards fishing harbors all our first-, second-, and third-class ports must also furnish facilities and accommodations for fishery. Thus all of these, i.e., three first-class ports, four second-class ports, and nine third-class ports, will be fishing harbors as well. But besides these sixteen ports there is still room and need to construct more fishing harbors along the coast of China. I propose, therefore, that five fishing harbors be constructed along the sorthern coast, that is, along the coast of Fengtien, Chili, and Shantung, as follows:—

(1) Antung, on Yalu River, on the border of Korea.

(2) Haiyangtao, on the Yalu Bay, south of Liaotung Peninsula.

(3) Chinwangtao, on the coast of Chili, between the Liaotung and Pechili gulfs, the present ice-free port of Chili province.

(4) Lungkau, on the northwestern side of Shantung Peninsula.

(5) Shitauwan, at the southeastern point of the Shantung Peninsula.

Six fishing harbors should be constructed along the eastern coast, that is, along the coasts of Kiangsu, Chekiang, and Fukien, as follows:—

(6) Shinyangkang, on the eastern coast of Kiangsu, south of the old mouth of the Hoangho.

(7) Luszekang, at the northern point of the Yangtze Estuary.

(8) Changtukang, in the midst of Chusan Archipelago.

(9) Shipu, north of Sanmen Bay, east of Chekiang.

(10) Funing, between Foochow and Wenchow, east of Fukien.

(11) Meichow Harbor, north of Meichow Island, between Foochow and Amoy.

Four fishing harbors should be constructed on the southern coast, that is, along the seaboard of Kwangtung and Hainan Island, as follows:—

(12) Sanmei, on the eastern coast of Kwangtung, between Hongkong and Swatow.

(13) Sikiang Mouth. This harbor should be on the northern side of Wangkum Island. When the Sikiang Mouth is regulated, the Wangkum Island will be connected with the mainland by a sea wall, so a good harbor site could thus be provided.

(14) Haian, situated at the end of the Luichow Peninsula opposite to Hoihou, on the other side of Hainan Strait.

(15) Yulinkiang, a fine natural harbor at the extreme south of the Hainan Island

These fifteen fishing harbors with the greater ports, numbering 31 in all, will link up the whole coast line of China from Antung, on the Korean border to Yamchow, near the Annam border, providing, on an average, a port for every 100 miles of coast line. This completes my project of seaports and fishing harbors for China.

At first sight objections might be raised that too many seaports and fishing harbors are provided for one country. But I must remind my readers that this one country, China, is as big as Europe and has a population larger than that of Europe. If we take a similar length of the coast line of western Europe we would see that there are many more ports in Europe than in China. Besides, the coast line of Europe is many times longer than that of China, and in every hundred miles of the European coast line there are more than one considerable-sized port. Take Holland, for instance. Its whole area is not larger than the hinterland of Swatow, one of our third-class seaports, yet it possesses two first-class ports, Amsterdam and Rotterdam, and numerous small fishing ports. Let us also compare our country with the United States of America in regard to seaports. America has only one-fourth the population of China yet the number of ports on her Atlantic coast alone is many times more than the number provided in my plan. Thus, this number of ports for China for the future is but a bare necessity. And I have considered only those that will pay from the beginning so as to adhere strictly to the principle of remuneration that was laid down at the outset of my first program. See map VII.

MAP VII.

Part V.—The Establishment of Shipbuilding Yards

When China is well developed according to my programs, the possession of an oversea mercantile fleet, of ships for coastal and inland water transportation, and of a large fishing fleet will be an urgent necessity. Before the outbreak of the late World War, the world's seagoing tonnage was 45,000,000 tons. If China is equally developed industrially, according to the proportion of her population, she would need at least 10,000,000 tons of oversea and coastal shipping for her transportation service. The building of this tonnage must be a part of our industrial development scheme. For cheap materials and labor can be obtained in the country, and so we could build ships for

ourselves much cheaper than any foreign country could do for us. And besides the building of a seagoing fleet, we have to build our inland water crafts and fishing fleets. Foreign shipping yards could not do this service for us on account of the impracticability of transporting such numerous small crafts across the ocean. Thus, in any case, China has to put up her own yards to build her inland water crafts and fishing fleets. So the establishment of shipbuilding yards is a necessary as well as a profitable undertaking from the beginning. The shipping yards should be established at such river and coastal ports that have the facility of supplying materials and labor. All the yards should be under one central management. Large capital should be invested in the project so as to procure a yearly output of 2,000,000 tons of various kinds of vessels.

All types of vessels should be standardized both in design and equipment. The old and wasteful types of inland water crafts and fishing boats should be replaced by modern efficient designs. The inland water crafts should be designed on the basis of certain standard drafts such as the 2-foot, 5-foot, and 10-foot classes. The fishing trawlers should be standardized into the one-day, the five-day and the ten-day service class. The coastal transports should be standardized into the 2,000-, the 4,000-, and the 6,000-ton class, and for oversea transports we should have standardized ships of 12,000-, 24,000-, and 36-000-ton classes. Thus, the many thousands of inland water crafts and fishing junks that now ply the rivers, lakes, and coasts of China may be displaced by new and cheaper crafts of a few standard types which could perform better service at less expense.

SUN YAT-SEN.

A Free Zone for Manila

"The government of the Philippine Islands will vote bonds sufficient to cover the expense necessary to the creation of this free zone and the construction of edifices, warehouses and docks proper to the same, together with other requirements for its proper administration. . . . There will be set aside P25,000 for the initial expenses of the free zone board in the preparation of plans and the compilation of data."

This paragraph is quoted from the Vamente free zone bill which was recently introduced into the lower house of the Philippine legislature, and the measure bids fair to win the approval of the lawmakers of that body.

The bill provides that the free zone at Manila be established and maintained by the secretary of commerce and communications, and that he takes action through a board consisting of the director of commerce and industry as president, and the insular of customs and the director of the bureau of public works as members.

This board will administrate the zone, the collector of customs making the rules for the handling of vessels and cargo, vessels to be free from the usual port entry and pilotage charges.

The board will recommend the site for the zone. It is believed among government circles, however, that the Tondo beach site recently recommended by Paul P. Whitham, United States Trade Commissioner, investigating trade and harbor conditions in the Far East for the federal government. Mr. Whitham estimates P80,000,000 as the final cost of the free zone development. It is also recommended that the zone be walled off and properly guarded to prevent smuggling.

That a free zone is the greatest individual requirement in making Manila the first port of the Orient is a current fact that has long been conceded by the most cynical "wat blanket business man" in the Philippines.

Manila is situated on the greatest trade route in the world, and in so far as the Orient is concerned, is the most centrally located point. Its harbor is at the southern end of Manila Bay, a great naturally sheltered body of water about thirty miles long, and is further protected by a breakwater over a mile in length. Its present water front is studded with three large piers, a fourth under construction by the government, and a fifth will soon be started by the Pacific Mail Steamship Company.

Under the provisions of the Free zone bill, goods shipped to Manila may be stored in the free zone and ultimately transhipped to any other country without paying any of the port charges and taxes levied on a cargo imported for Philippine consumption. This would mean a leap in total tonnage and would also solve the freight problem, as many of the ships transhipping cargo at Manila could load Philippine exports which otherwise would lay on the dock waiting the straight schedule ships.

Chinese Stamp Tax in Foreign Concessions

The Diplomatic Body at Peking has agreed with the Government of China that the Chinese Stamp Tax shall be enforced on Chinese residents within the limits of the Foreign Concessions in China and a joint proclamation in the names of the Bureau of Foreign Affairs for Chihli and the Sub-Department of Stamp Duty for Chihli has been issued setting forth the origin and steps taken to enforce this law within the Foreign Concessions and giving a schedule of the duties to be collected.

The Chinese Authorities issuing this joint proclamation requested that it should be posted in the various Foreign Concessions that the Chinese subjects resident within the Concessions should be instructed lawfully to obey the regulations as set forth.

The Diplomatic Body in Peking agreed to the collection of the stamp tax in the foreign concessions only with the provise that it is a tentative step, accepted with the clear understanding that the rights of the foreign administrations and of foreign nationals in the settlements shall not suffer any inconvenience nor appear to be infringed thereby. In this latter case the measure is to be modified or if necessary cancelled.

The tax which is collectable upon practically all written instruments used in connection with business transactions, involving amounts of $1.00 or over is 1 cent, and in some cases where the amount is over $10 the tax is 2 cents. On bills of lading, insurance policies, bills of exchange, promissory notes, wills and partnership agreements the schedules run from 1 cent to $1.50.

Foreign police officers in the concessions are empowered to enforce the payment of the tax. Persons who fail to pay the tax are subject to fines, to be collected by the consulate of the concession in question. The stamps are to be on sale in all Chinese Post Offices. The regulations go into effect on May 1. No funds are made available for the enforcement of the tax provisions by the foreign officials, except that they are to retain half on the fines collected from delinquents.—"North China Star."

Japanese Ownership of Railroads

Government ownership of railroads in Japan has been a success, because it has found favor with the great majority of the people from its inception, according to Mr. Yosuki Tsurumi, secretary of the imperial government railroads.

"The divided attitude of the American public on the question of government ownership, however," said Mr. Yosuki, "probably would make the permanent taking over of the lines in this country precarious.

"The success of government ownership of railroads depends entirely on the support given the movement by the general public and the hundreds of thousands of employes of the railroads. In Japan, almost all the lines were nationalized 14 years ago, and the returns since have averaged six to seven per cent. on the invested capital.

"The entire profits are used for the improvement and extension of the roads. We have managed to do this because we have had the confidence and support of the public and the employes, all of whom felt that better transportation was and is possible through government control.

"As we have no dividends to pay, we have been able to pay better wages to our employes, as much of the money formerly turned back to stockholders is now available to pay workers more in their weekly and monthly envelopes.

"The employes also further favor government ownership because it offers them greater security in their positions. In a country like Japan opportunities for working people are fewer than they are in the United States, and it is more essential that the workers obtain permanent positions."—From *Christian Science Monitor.*

Improvement of the Physical Conditions of Open Lines in Japan

Some Engineering Features of the Atami Deviation

THE railways in Japan, as originally laid, were almost exclusively single track lines, and it was not till 1881 that the first section of the Tokaido Line, between Tokyo and Yokohama, was double-tracked. Duplication work was then pushed on throughout the entire line between Tokyo (Shimbashi) and Kobe and completed in 1913. Similar work was carried out on some of the purchased trunk lines, and good progress has been made in this respect, the second or more main tracks increasing from 466 miles in 1907-8 to 804 miles in 1916-17, which means a gain of 338 miles in ten years. The duplication work completed or in hand is shown below:—

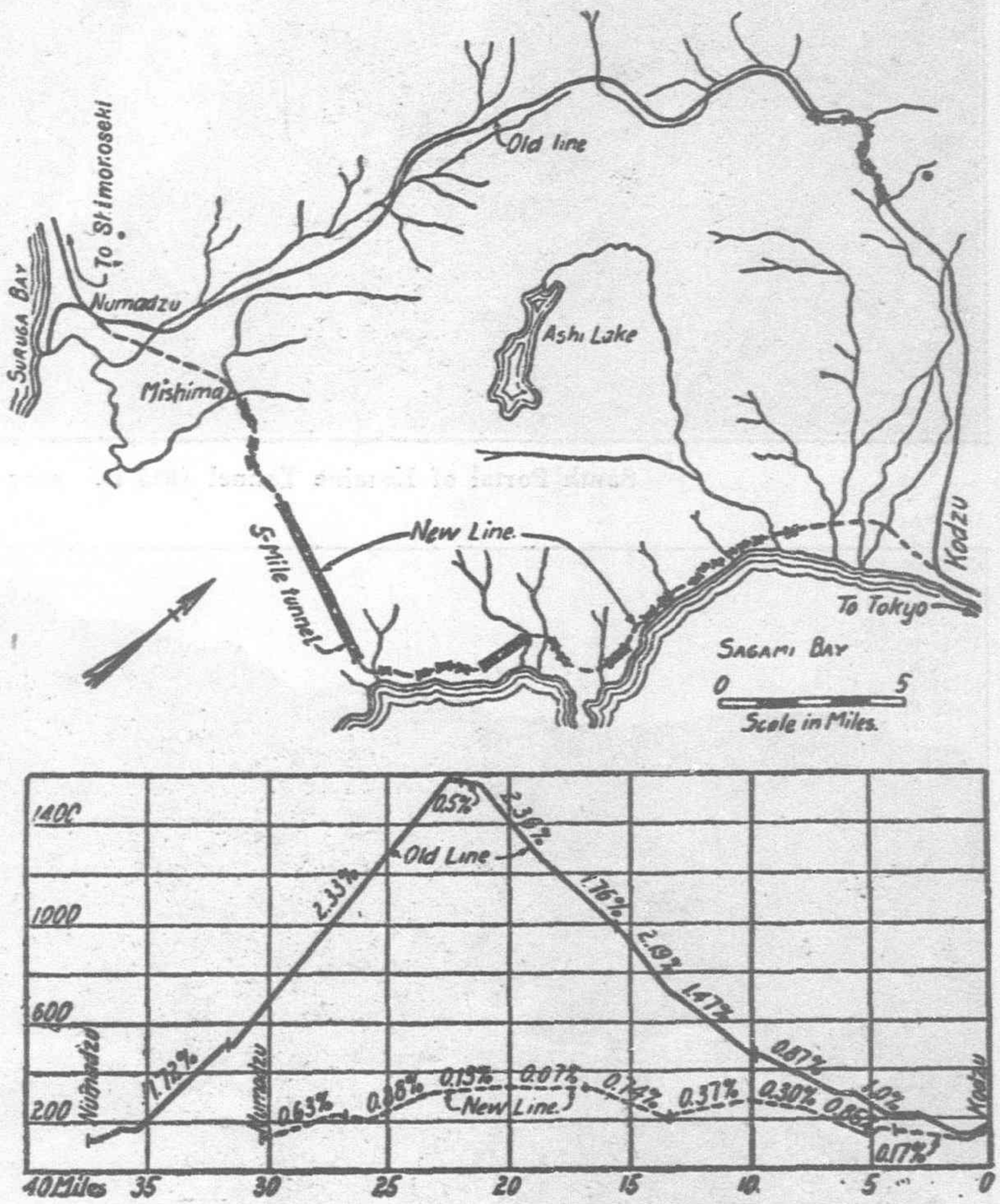
Line	Work completed or in progress	Work projected
Tokaido Main ..	Duplication.	Four tracks between Tokyo and Kozu and Kyoto and Kobe.
Yokosuka	Duplication.	
San-yo	Duplication between Kobe and Yoshinaga; work on Himeji-Kamigori in progress.	Duplication between Kobe and Hiroshima.
North Eastern ..	Duplication between Ueno and Utsunomiya; six tracks between Ueno and Nippori and four tracks between Nippori and Tabata.	Duplication between Ueno and Fukushima.
Yamate	Duplication between Shinagawa and Tabata.	Four tracks between Shinagawa and Tabata.
Joban	Duplication between Nippori and Ueno; Tomobe and Mito and Yumoto and Taira; work on Mito-Isohara in progress.	Duplication between Ueno and Taira.
Central Main ..	Duplication between Manseibashi and Kokubunji.	Duplication between Tokyo and Hachioji.
Shin-Etsu Main ..	Duplication between Shinonoi and Nagano in progress.	Duplication between Shinonoi and Naoetsu.
Kagoshima Main..	Duplication between Moji and Akama; work on Akama-Tosu in progress.	Duplication between Moji and Tosu.
Chikuho Main ..	Duplication between Orio and Iizuka and Nogata and Ida.	Four tracks between Orio and Nogata in progress.
Hakodate Main ..	Duplication between Temiya and Iwamizawa.	
Muroran Main ..	Duplication between Muroran and Wanishi and duplication of Yubari branch.	Duplication between Oiwake and Muroran and Oiwake and Yubari,

Deviation and Grade Reduction

The mountainous character of the country involved the use of heavy grades and sharp curvature. As traffic increased, however, it was found necessary to resort to reconstruction, with a view to reducing gradients and improving the alignment, while the increased speed of the trains has called for the adjustment of the reverse curvature. These improvements have been carried out wherever necessary, as shown in the subjoined statement:—

Line	Length	Cost	Remark
Complete:—	*mile*	*yen*	
Tokaido Main	2.8	460,000	For increasing capacity of line.
Kagoshima Main	7.4	1,400,000	,,
Hakodate Main	18.6	657,483	,,
O-U Main	.8	450,000	Collapse of tunnel from flood.
Central	.5	177,000	,,
Tokaido	4.0	120,000	Station improvement.
Sanuki	.8	341,000	,,
Hokuriku	2.0	125,000	,,
Kansai	2.4	60,000	Link to Sakuranomiya.
Incomplete:—			
Tokaido Main { Kozu-Numazu	37.4	24,240,000	For increasing capacity of line.
Tokaido Main { Kyoto-Otsu	10.0	6,000,000	
North-Eastern Main	25.4	2,317,438	,,
Hakodate Main	10.0	240,000	,,
San-yo	3.7	467,000	Riparian improvement.

Most important reconstruction work is now under way at two places on the Tokaido Line, i.e., the Kozu-Numazu and the Otsu-Kyoto section. The Tokaido (Tokyo-Kobe) Line is one of the main arteries of the State system, and its duplication was completed in 1913. The gradient of the line is mostly 1 in 100, with the sharpest curve of 15ch. radius, but, as originally constructed, the 1 in 40 to 50 maximum grade was allowed at places. Such is the section between Kozu and Numazu, where the line is led on a gradient of 1 in 40 over the steep Hakone pass. In order to relieve the strain placed upon this mountainous section by the growing traffic, the plan of laying a detour viâ Atami was adopted. The new route follows a straighter alignment and will reduce the ruling gradient to one per cent., while shortening the distance from 37 miles to 30 miles. On the other hand it involves the boring of a tunnel, 5 miles in length, the longest of the kind in Japan.



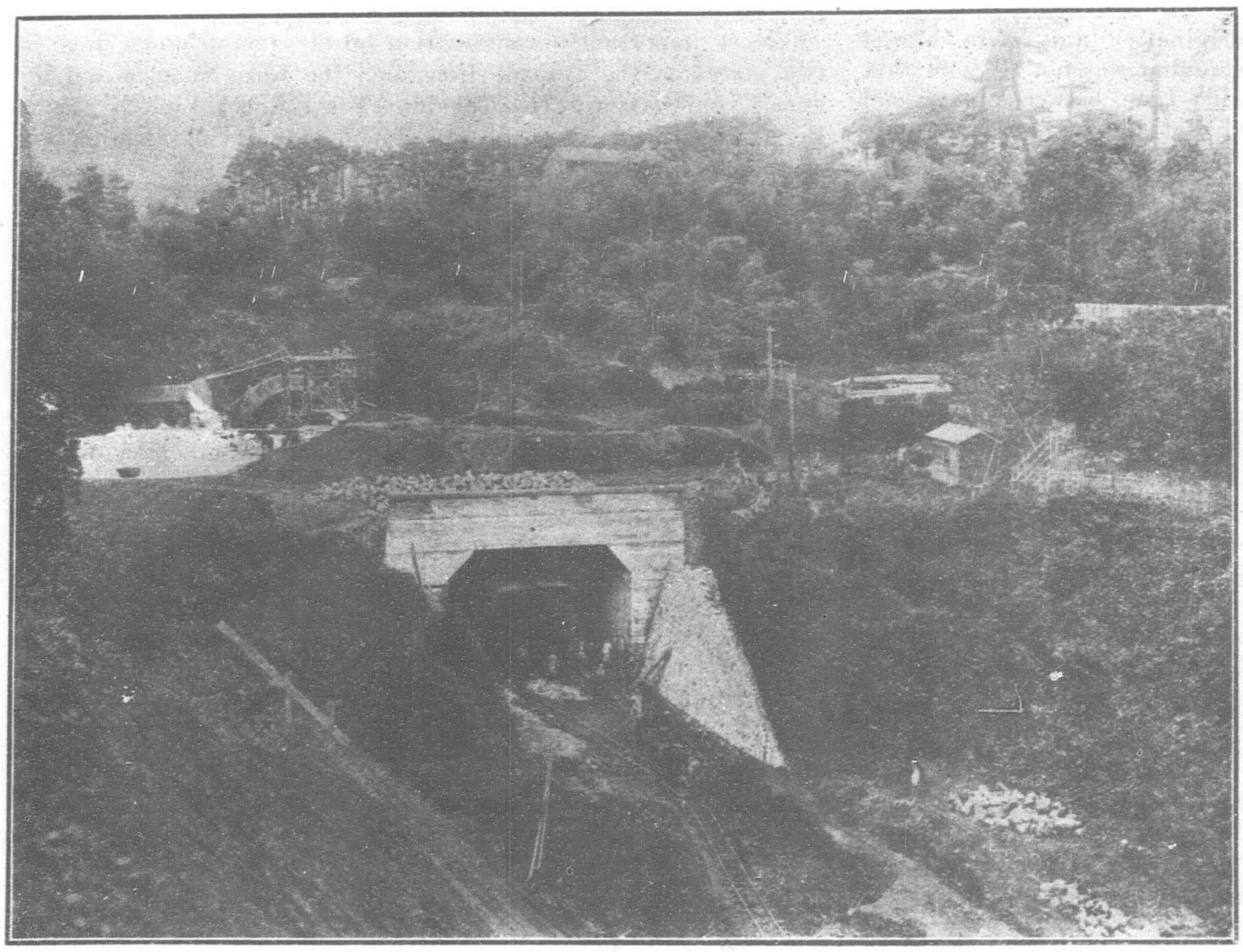
Map and Profile of the Atami Deviation.

The new line starts at Kozu Station and, passing the town of Odawara, follows a southerly direction along the coast on the Sagami Bay as far as Atami, a famous geyser spring resort. Thence it traverses a tunnel of about 5 miles and reaches Mishima. From this town it runs westward almost parallel to the existing track until it joins the latter at Namazu Station.

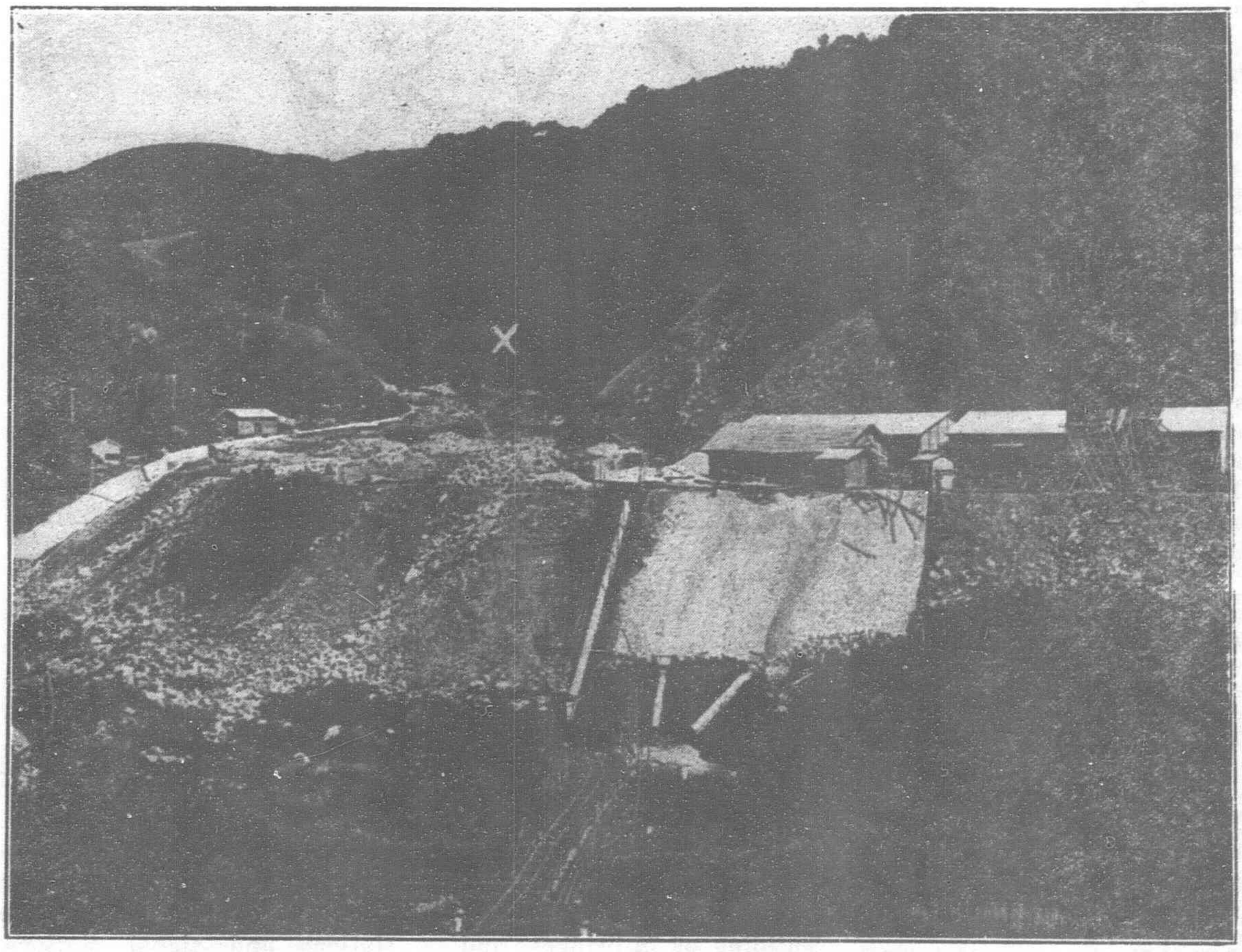
The projected line measures 30 miles 14 chains in length with the ruling gradient of 1 in 100 and the sharpest curve of 20 chain radius. It involves the boring of altogether 23 tunnels, and the building of 72 bridges and 8 stations and signal stations. Compared with the Kozu-Numazu section it is about 7 miles

shorter and has 1 in 100 ruling gradient as against 1 in 40, with the sharpest curve of the same radius. The highest point of the new line is in the Tanna Tunnel which is 255 ft. above the sea-level, while that of the Kozu-Numazu line is 1,500 ft. above the sea-level, that is at Gotemba. When reduced to equated length, the mileage of the lines is 39.2 m. and 74.2 m. respectively, showing a 35 m. or 50 per cent. reduction in the new deviation. As for traction, the new line will enable the locomotives to be 2.5 to 3 times as effective as on the old line, though of course this relative power varies according to the type of engines.

The line first traverses the valleys of two rivers, the Sakawa and the Hayakawa, especially where they are often liable to overflow. Then as that part of the neck of the Izu Peninsula which borders on the Sagami Bay abounds in rugged peaks and precipices overhanging the sea, the line has to skirt the foot of mountains, pierce hill-sides, and cross gorges. Naturally it often runs across or is parallel to the prefectural road and the tracks of the Dainppon Tramway Company. So the construction of this deviation involves a number of bridges, viaducts and tunnels. Besides it entails large amount of cutting and reclaiming and the construction of huge retaining walls. All these are expected to tax the skill of the Japanese engineers and it is not too much to say that this is the most difficult work that has ever been taken up in Japan.



South Portal of Komine Tunnel (855 ft.) near Odawara.



Southern Approaches to Tanna Tunnel under Construction. × Tunnel Entrance.

A Five-Mile Tunnel

The Tanna Tunnel measures about 5 miles in length. According to the plan it has double tracks, is 28 ft. wide and 22 ft. 6 in. high above the formation line, with a cross-sectional area of 544 sq. ft. Besides, being the longest in Japan and one of the biggest double-track tunnels in the world, this bore presents very interesting features both from the engineering and geological point of view. The tunnel is to lie across a volcanic region, piercing part of the ranges that form the crater wall of the now extinct Atami volcano, and traversing the middle part of the Tanna basion which is supposed to be a maar. Work under such physical conditions has never been known in the world's history of tunnel engineering. It is therefore expected that numerous data of interest and value for geological and engineering studies will be obtained as to the earth's crust, ground temperature and water.

The headings were driven from the east and west portals, and they have now reached over 2,100 ft. at the former and over 2,400 ft. at the latter. The driving is carried on by means of air rock-drills. To operate them a compressor plant has been installed at each portal. For the purpose of removing excavations and conveying timber-

ing and lining materials, trains are run on 2 ft. 6 in. gauge tracks, hauled by electric locomotives. To supply electricity for use in the whole undertaking, a steam power plant is to be established at the west portal, where will be installed four 400 h.p. Takuma boilers and a 3,200 k.w. three-phase generators, 2,300 volt, 60 cycles, directly coupled to a Parson horizontal turbine. From this electric power will be transmitted to the substation which is to be erected both at the east and west portals. Pending the completion of the power plant, the air to be used for the rock-drills is supplied by the air-compressors worked by the steam-engine that has been temporarily installed at each portal.

The earth work and others on the Kozu-Hayakawa section, 5 m. 27 ch. in length, were commenced in December 1916 and were finished in January 1919. Plate-laying and girder building have made good progress on this section and the portion between Kozu and Odawara, measuring 3 m. 70 ch., will be opened to traffic in October this year. The next section Hayakawa-Enoura, 5 m. 16 ch. in length, was taken up for construction in August 1919, the earth and other works being now well forward. It was in April 1918 that the boring of the Tanna Tunnel, earth and other incidental works of the eastern and western approaches thereto were taken in hand, but its completion will take six years more, when the whole of this line will be opened as part of the Tokaido Main Line.

The details of the new deviation as compared with the existing line are as follow:—

Item	Unit	Existing Line	New Deviation
Length	m.	37.5	30.2
Highest point of track above sea-level	ft.	1,499	243
Aggregate height of track levels upward and downward	,,	3,018	721
Ruling gradient		1/40	1/100
Length of ruling gradient	m.	12.1	6.7
Aggregate inter-section angle of curves	deg.	2,061	1,431
Aggregate length of bridges	ft.	3,100	5,300
No. of tunnels		7	23
Aggregate length of tunnels	ft.	7,560	50,596
Equated length	m.	72.2	39.3

The 10-mile section between Otsu and Kyoto forms one of the natural bars to the traffic on the Tokaido Line on account of the heavy gradient on which the intercepting chains of hills are negotiated. The reconstruction now in progress is designed to reduce the maximum gradient of 1 in 40 to 1 in 100, by boring through the pass a tunnel 2,181 ft. long.

Relaying

The pioneer railway lines in Japan—the Tokyo-Yokohama and the Kobe-Kyoto section—were laid with 60lb. double-headed rails of English make, but on the lines subsequently laid 60lb. flat-bottomed rails of English make were used, while for the lines in the Island of Hokkaido 45lb. rails were adopted. Later on, 60lb. rails of the Pennsylvania type were introduced, replacing the double-headed rails on the main lines. The nationalization of the railways in 1906 and 1907 gave the Railway Management an opportunity to think out a plan of unifying the rails on the system, these being of divers types and dimensions and including 70 lb., 60 lb., 56 lb., 50 lb., and 45 lb.,—a cause of serious trouble in the maintenance work. It was also found necessary, in view of the increase in train loads and speed called for by the growth of traffic, to strengthen some trunk lines with heavier metals. The type of the American Association of Civil Engineers was adopted as a standard type, and it was decided to relay the main trunk lines with 75 lb. rails, such as the Tokaido and the San-yo main lines and certain heavy sections of the North Eastern Line, while the relaying with 60 lb. rails of the sections laid with the lighter rails has also been energetically carried out from year to year.

The following statement shows the kinds of rails used on the various lines on March 31, 1917:—

Line	75lb.	70lb.	60lb.	56lb.	50lb.	45lb.	Total
	m. c. l.	m. c. l.	m. c. l.	m. c. l.	m. c. l.	m. c. l.	m. c. l.
Tokaido	511 23 68	10 48 59	401 28 89	—	0 09 29	—	923 30 45
Hokuriku	5 13 55	—	229 56 01	—	34 38 00	—	269 27 56
Central	20 76 94	—	294 42 58	—	—	—	315 39 52
San-yo	4 37 15	106 39 61	369 55 96	—	3 22 39	—	483 75 11
San-in	25 43 63	—	258 56 28	—	13 53 72	—	297 73 63
Kansai	—	—	301 52 29	—	40 34 41	—	342 06 70
North Eastern	11 34 28	4 53 39	1,009 29 66	—	17 53 44	—	1,043 10 77
Gan-Etsu	—	—	108 14 11	—	—	—	108 14 11
O-U	24 10 34	—	363 29 82	—	4 04 47	—	391 44 63
Riku-U	—	—	28 07 42	—	—	—	28 07 42
Shin-Etsu	10 35 24	—	231 34 60	—	—	—	241 69 84
Sobu	—	—	135 33 86	—	53 70 70	—	189 24 56
Sanuki	—	—	37 41 29	—	7 46 61	7 61 68	52 69 58
Tokushima	—	—	—	—	46 13 40	—	46 12 40
Kagoshima	21 20 11	—	273 66 40	—	26 30 51	—	321 37 02
Nagasaki	—	131 68 02	—	—	13 56 35	—	145 44 37
Hoshu	—	—	142 56 65	2 65 11	17 78 69	—	163 40 45
Chikuho	—	—	97 77 84	—	8 72 10	—	106 69 94
Miyazaki	—	—	69 49 00	—	—	—	69 49 00
Sendai	—	—	31 03 71	—	—	—	31 03 71
Hakodate	—	—	337 10 60	—	5 49 81	9 25 69	352 06 10
Muroran	—	—	153 08 97	—	—	—	153 08 97
Rumoe	—	—	31 32 00	—	—	—	31 32 00
Kushiro	—	—	168 26 58	—	—	59 46 40	277 72 98
Soya	—	—	0 25 14	—	—	106 44 49	106 69 53
Abashiri	—	—	119 49 61	—	19 78 24	31 20 25	170 68 10
Total	634 54 92	121 61 59	5,325 77 29	2 65 11	313 62 84	214 38 51	6,613 29 55

The following statement shows the length of the lines strengthened by the relaying with 75lb., 70lb., and 60lb. rails.

Line	75lb.	70lb.	60lb.
	m. c. l.	m. c. l.	m. c. l.
Tokaido	423 79 60	11 71 77	13 17 51
Hokuriku	6 19 17	—	3 50 93
Central	18 71 54	—	2 28 92
San-yo	4 25 46	40 10 48	32 12 55
Kansai	—	—	45 76 00
North Eastern	9 24 88	—	10 46 80
Gan-Etsu	—	—	0 21 52
O-U	22 33 57	—	2 03 74
Shin-Etsu	10 37 45	—	3 27 49
Sobu	—	—	98 74 79
Sanuki	—	—	2 45 03
Kagoshima	14 20 31	—	67 43 97
Nagasaki	—	—	130 66 02
Hoshu	—	—	35 31 91
Chikuho	—	—	28 52 68
Hakodate	—	—	68 66 46
Muroran	—	—	15 74 07
Kushiro	—	—	112 47 96
Soya	—	—	0 20 00
Abashiri	—	—	26 37 05
Total	509 71 98	52 02 25	701 45 40

New Stations

The provision of new stations has been necessitated at various points on the existing lines, as a result of the development of local industries, and also where the lines connect with, or are crossed by, new extensions. On the other hand, the shortening of the block sections due to the increase in the train service required an increasing number of flag stations.

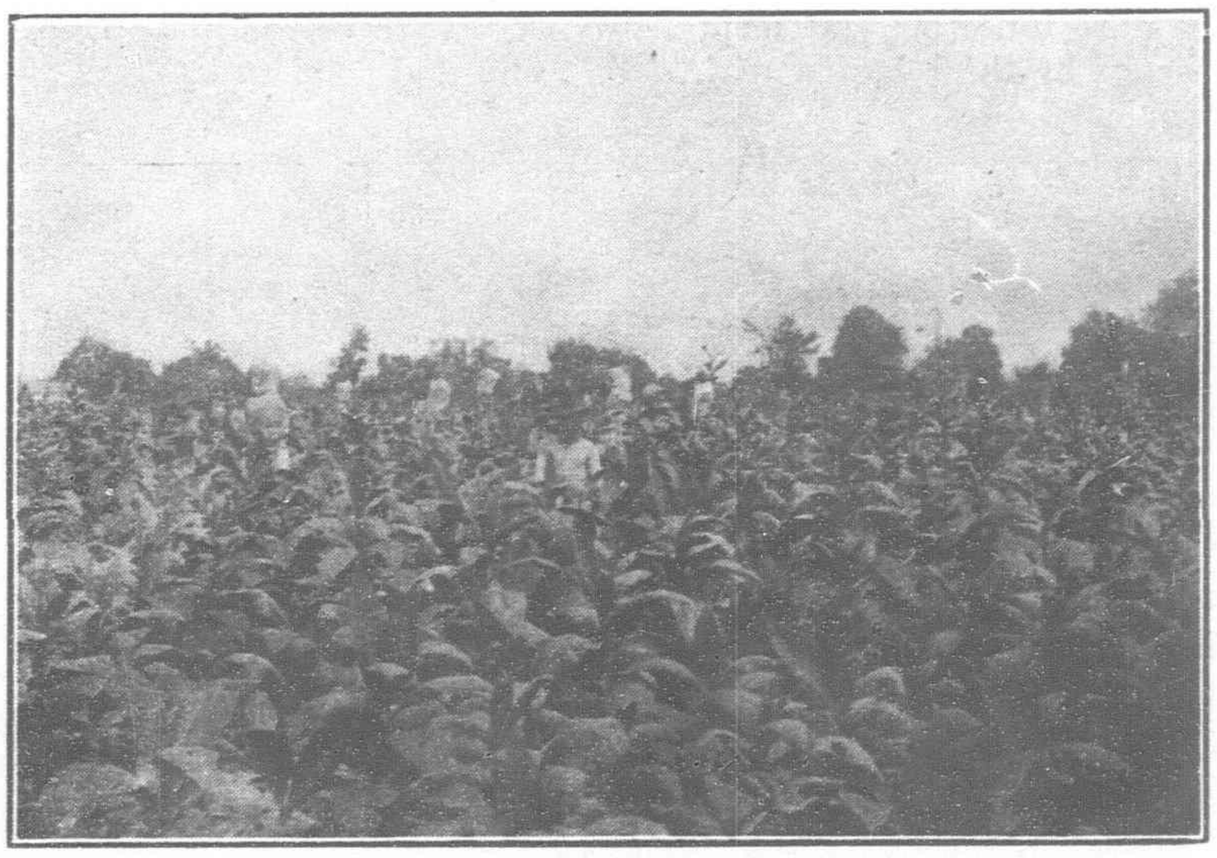
The following statement shows the new stations built during the ten years ending March 31, 1917:—

Year ending March 31	Stations	Flag Stations	Junctions	Total
1908	7	2	—	9
1909	27	2	—	28
1910	20	2	—	22
1911	21	8	2	31
1912	16	12	3	31
1913	14	13	1	28
1914	20	6	2	28
1915	11	3	0	14
1916	7	3	1	11
1917	12	6	—	18
Total	154	57	9	220

Philippine Tobacco Staking a Claim

By J. J. HERIER, of the "Times Press," Manila

THROUGH the tobacco industry more than through any other single agency, the Philippine Islands is being constantly thrust upon the attention of the people of the United States, and, in a growing measure on that of the world at large. In addition to providing the archipelago with one of its most important and consistently profitable sources of revenue, tobacco as an article of export also acts as a medium of publicity in keeping the term "Manila," with its associate idea "The Philippines," constantly and repeatedly in the consciousness of the outside trading public. "Manila" tobacco, "Manila" cigars—what other single product does in a similar manner distribute itself and the name associated with its origin before the eyes of so many thousands of consumers across the seas? Indeed, it is the peculiarity of this particular article to advertise the country of its origin, a peculiarity not possessed to the same extent by any other product. Thus we have "Egyptian" tobacco, "Cuban" tobacco, "Turkish" tobacco, etc., with their diversities in names of brands and varieties of forms through which they seek to attract the consumer.



Tobacco Field in the Philippine Islands

Through a partial acknowledgement of this truth, as well as because of a grave threat of a considerable loss to the government coffers in case of failure of American demand, Manila tobacco men, in co-operation with the Philippine government, are at present bending every effort in maintaining their hold upon the American markets, and, through process of legislative regulation and systematic advertising, to create an increased demand for Philippine tobacco in the United States. That this propaganda, already under way, will result in establishing the Manila cigar on the American markets with permanency, has already nearly been proven, judging from advance information. A prejudice of a decade against Manila tobaccos is fast vanishing. The war provided an unexpected *entré* into American markets, which was intelligently seized upon by the Philippine manufacturers. To-day, vigorous enterprise is being shown in improving this opportunity.

However, in the situation lurks a danger which if not met by direct action and overcome, may undo all advantages gained thus far. This danger admittedly lies in the agricultural phase of the Philippine tobacco industry, and it is to this that the government is giving careful attention. A complete and thorough examination of the situation by the bureau of agriculture and the bureau of internal revenue during the past three years resulted in an understanding of underlying causes which hitherto crippled output and injured promising opportunities. Legislation, based upon these revelations and recommendations for improvements, is now in full operation; and improvement of striking character goes on apace.

Appropriations have been made without stint, and unremitting labors of experts and tobacco exponents have been utilized in the endeavor to modernize the entire industry and to place it in a position to compete with Cuba, Sumatra, The United States and other centres of supply. The purpose of the movement is to make Philippine tobacco as individualistic as any other of the standard varieties on the world markets. Given time, success in the undertaking is inevitable, say Manila merchants.

What are the agricultural difficulties, and what is the prejudice which the industry contends in its endeavor to win recognition in America?

Until recently, no organized attempt on a large scale had ever been made to create and supply a large, permanent demand for the article. The trade was in the hands of small buyers and jobbers, who purchased from the native or Chinese growers in terms most profitable to themselves, and who sold in turn to larger exporters.

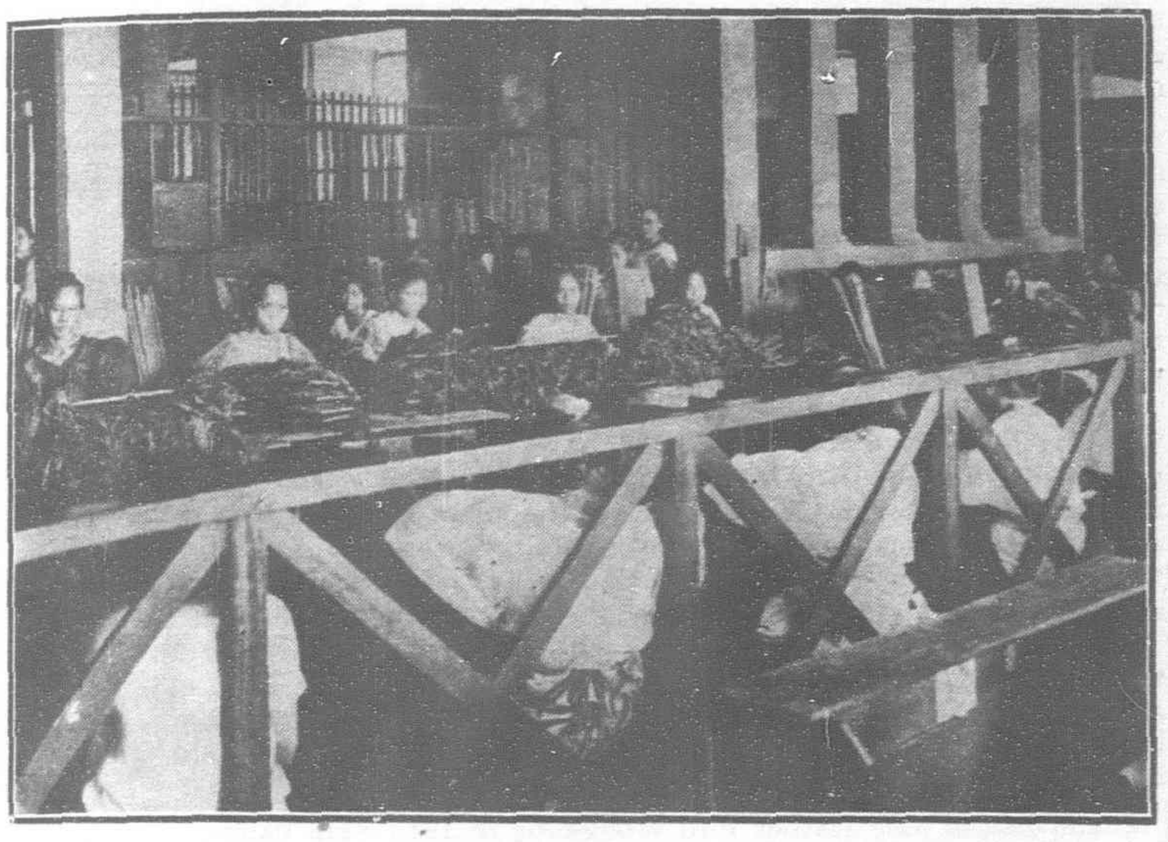
The native planter was given no stimulus and no encouragement to adopt new methods of culture or to attempt improvements in quantity or quality through scientific innovations. Hidebound custom and age-old ignorance governed tillage methods and curing processes. The Cagayan valley, which is by far the foremost tobacco-producing region of the islands, is decidedly backward, notwithstanding its marvelous natural advantages. Most antiquated methods of culture prevail. This in part is a natural result of its geographical isolation. In addition, so small has been the income of the planter, that he can provide the bare necessities of life only with difficulties. He struggles from season to season with a scant subsistence level. That in the past the tobacco industry has been neglected and sadly ignored by the insular government, is demonstrated by figures presented by J. J. Rafferty, former director of the bureau of internal revenue, showing that the greater portion of P.6,000,000 annually collected by the government as revenues from the tobacco industry is derived from the Cagayan valley alone.

Dealers selecting Tobacco Leaves at "Compania General de Tabaccos de Filipinas", Manila, P.I.

He shows further that public works have been neglected; schools are inadequate; health measures are in urgent need; means of communication between the valley and other points are meagre, and within the valley during a larger part of the year, next to impossible, and mail service primitive and unreliable. Thousands of hectares of fertile land still lie idle, isolated through lack of roads, despite overpopulation in sur-

rounding districts. Unhygenic living, insanitary surroundings, pestilence and ignorance through lack of educational institutions do much to retard effort on the part of the natives and to render their labor ineffectual.

In other important tobacco regions of the world the question of pure strains in tobacco culture, together with uniformity of plant and leaf are considered of the highest importance commercially. All possible care is taken to secure and perpetuate purity of strain. No attention is given this matter by the Cagayan valley farmer. The idea has obviously never occurred to him nor are better and more profitable methods of culture and seeding known to him.



Women separating the Veins of Tobacco at the "La Insular" Cigar Factory, Manila, P.I.

Losses of 60 and 70 per cent. of the season's crop through insect parasites, rains, and improper provisions in the care of seed are common events in the life of the Cagayan valley farmer. It may be said that as yet the entire tobacco culture of this most productive region is in the unskilled and undirected hands of small farmers. Unlike the situation commonly found in Cuba, Borneo, Sumatra, and other great tobacco regions, where plantations are large and all phases of operation and maintenance controlled by one or a few persons, the tobacco is grown almost entirely by small individual planters, who must bear all the losses from ravages of insect pests, unfavorable seasons, storms and those things incident to inadequate curing facilities, to say nothing of usurious rates of interest and unscrupulous tactics of tobacco buyers at whose mercy they too often find themselves.

Plainly, then, unless all publicity and propaganda work to establish Philippine tobacco in the American market is to go for nought the government and the tobacco interests must take the bull by the horns, and by intelligent and co-operative effort and ungrudging expenditure lay under the industry an agricultural foundation which will insure a plentiful and permanent supply of good Philippine tobacco to fill the demand which is being created. This situation is fully appreciated and no stone is being left unturned in the endeavor to bring it to a successful issue.

Warehouses are being established to enable the planters to secure loans on his harvested stocks, thus obviating the necessity of disposing of his current crop each season at low prices; credits have been extended; free timber grants established, which will improve handling and curing facilities; selected seed is being distributed gratuitously through government agencies, and finally an extensive educational campaign is being carried on by the bureau of agriculture and the bureau of education to back improved methods and to educate the younger generation more fully.

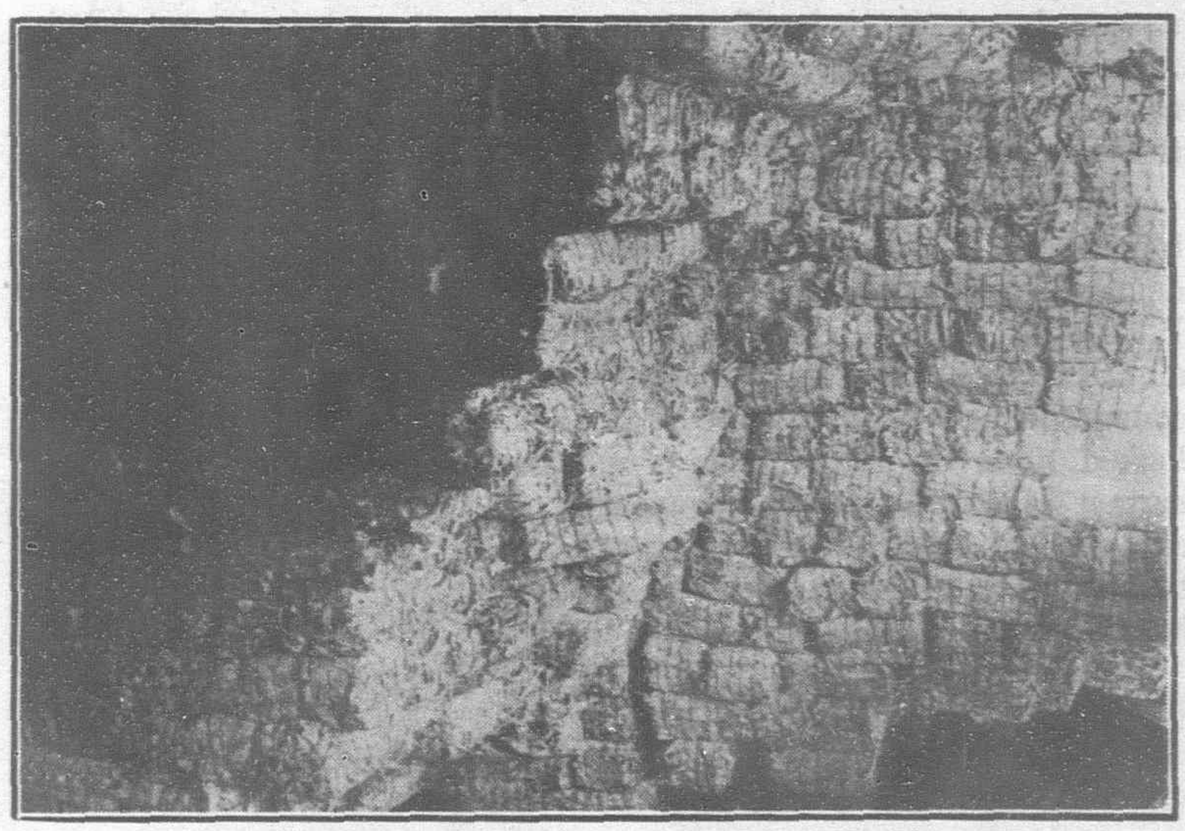
Manila cigars have in the past, suffered a not entirely unjustified discredit which has now been removed. Shady practices of Philippine exporters, dating as far back as 1910, have caused suspicion and mistrust with American buyers, and no organized move was made to overcome it until a few years ago. Export trade was left to take care of itself, and, until 1916, there had been no growth therein. In fact at times a distinct falling off was disclosed.

The Manila manufacturer was frankly unbusiness-like, careless, and at times undeniably dishonest. Correspondence was handled in a slipshod and negligent manner, coupled with a general disinclination to extend the customary credits. Goods arrived in the United States in damaged condition; sizes, shapes and colors were not suited to the market and were out of accord with the buyers' specifications. Manufacturers declined to take back or replace damaged goods, and consequently undesirable cigars were thrown on the market at auction, discrediting the goods in the eyes of both dealer and consumer.

Finally, the quality of the Manila cigar was permitted to be lowered to such an extent that it was considered unsmokable and worthless. In 1916 the Philippine legislature enacted a measure known as the tobacco inspection law, in order to promote the tobacco industry; several features aimed directly at the bad practices on the part of the manufacturers.

The law, among other things, provided for improvement of leaf quality; for inspection of leaf tobacco and of manufactured products, and prohibited the exportation thereof to the United States unless they complied with certain fixed standards. It also provided for the appointment of tobacco agents in the United States to represent the island product generally, and for the payment by the government for the expenses incurred for reconditioning cigars which after inspection reached the United States in damaged condition.

This law represented a far-sighted policy in seizing the opportunity presented by the war. Necessity of growing food stuffs and lack of labor had diminished the tobacco output in the United States while the island conditions remained substantially unchanged. When American tobacco dealers called upon the Philippines to supply their diminishing markets the island exporter determined not only to answer that call but also to utilize it as an opportunity to rehabilitate his lost reputation and create a faith that would carry on through, the post-bellum



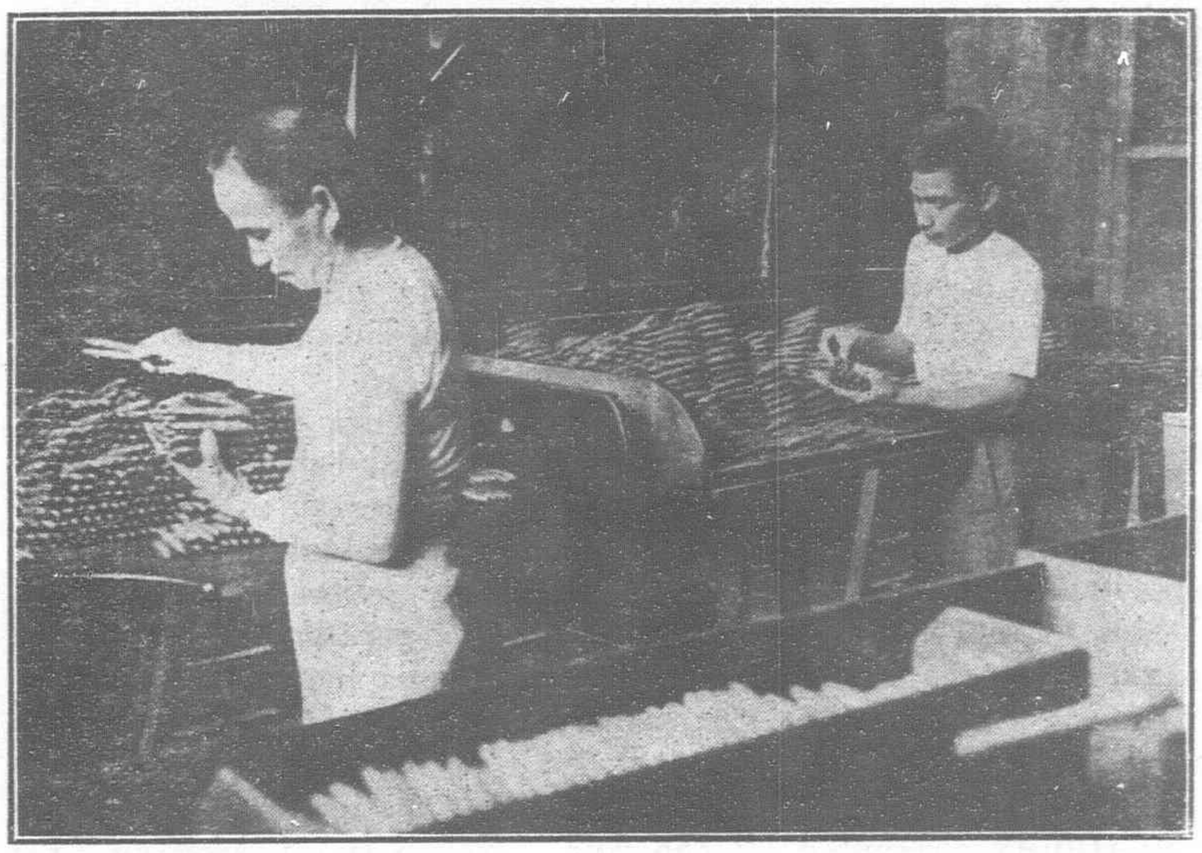
Tobacco Bodaga of the "La Insular" Factory. showing Tobacco Leaves in Bales

years. This he has done. The year 1919 witnessed the exportation of 392,300,000 cigars; in 1918 360,000,000 cigars were exported from the islands; 176,000,000 in 1917 and 114,000,000 in 1916.

A long period of unbroken and unprecedented rains inundated and destroyed large areas of the 1919 crop. Following this a drought took heavy toll from the already damaged plantations. However, as cigars are manufactured from the leaf of previous crops the reduced crop of 1919 will have small influence on the immediate cigar business. During the first six months of 1919 cigar exports increased in value by P.3,000,000 over the amount for the same period of 1918, with the June figure 75 per cent. greater than that of any preceding month.

It is expected that a serious curtailment of these figures will occur this year, however; and insofar as the future for Manila cigars in American markets rests on popular priced goods,

together with an estimated damage of 50 per cent. to the 1919 crops by storm and drought, and the rigid protective standards which are being enforced, the outlook for the present year is considered rather doubtful. Furthermore, Manila manufacturers believe that the increase in exportation of Manila cigars to the United States during 1917-1918 was due almost entirely to war conditions, and not to results from the newly undertaken publicity campaign. It is estimated that 3 per cent. of the cigars now used in the United States are Manilas.



Selecting and Sorting in the "Insular" Factory, Manila

The export of tobacco leaf from the Islands is to be discouraged rather than encouraged, as in view of the large supply and comparative cheapness of labor, it it considered better for the economic condition of the home country to increase manufacture of tobacco products, and keep at home money spent on all attendant operations. Moreover, leaf export to the United States is now reduced to insignificant proportions; and it is not likely, in view of the large crops there and the return of cheaper grades to the market that this trade will revive of its own accord in the near future.

However, reviving markets in Spain and England are calling for the local product, and local factories are supplying the demand. Exports of leaf tobacco in January were valued at P.3,019,847, which, compared with the figures of the previous month, which were P.1,667,446, shows a decided increase in the consumption of Philippine leaf in foreign countries. This is looked upon by the tobacco prophets of the Islands as the forerunner of a great future prosperity in the home manufacture of cigars and cigarettes. Both cultivation and manufacture of tobacco require large amounts of hand labor. This the Islands have in abundance. Encourage the home industry, is the cry.

Growth of Flour Milling in Hankow

Wheat has become one of the principal crops of Central China, writes Consul-General Edwin S. Cunningham, while at Hankow, and a recent investigation discloses the fact that it is grown in practically every section of the consular district. There are already flour mills in Hankow which are reasonably prosperous, and others are under contemplation. The production of wheat has increased marvelously during recent years, and it was a matter of considerable surprise that greater efforts were not made by the Allied Governments to induce the Chinese farmers to adopt modern methods, which would have trebled the production of wheat at the time when foodstuffs were extremely desirable. Wheat is one of the principal articles of export from Hankow, the volume of the trade having increased from 59,373 bushels in 1914 to 5,214,087 bushels in 1918. This development of wheat growing opens a large opportunity for the growth of the flour-milling industry, and with it for the sale of flour-milling machinery. It is worth while for American manufacturers of milling machinery and supplies to keep in touch with the situation here through engineering firms which import such machinery from foreign countries.—**U. S. Consular Reports.**

Modern Tannery in Hongkong

In 1917 a modern tannery was constructed by Chinese interests in Hongkong, says U. S. Consul-General George E. Anderson, the plant being located on the mainland portion of the colony on the site of a smaller native tannery which had been in operation for many years and which furnished, in fact, the financial and commercial foundation for the new undertaking. The actual operation of the new tannery was undertaken in January, 1918; but a short trial demonstrated that it was not a practical success, although the new plant was equipped with modern machinery of all sorts, including a considerable outfit from the United States, and had been constructed under the direction of a foreign trained Chinese chemist and leather expert. The plant became idle, and was acquired by a British concern which reorganized it, enlisted an American leather expert and sent him to the United States to purchase additional modern equipment. Now under this British reorganization, including American financial interests, the plant has commenced the actual tanning of leather.

Already considerable quantities of sole leather have been produced, and with the beginning of 1920 the tannery commenced the production of chrome leather of practically all ordinary grades. The entire business is under British and American financial and technical control. It is producing a comparatively high grade of sole leather and a very fair grade of chrome calf and similar leathers at prices which cannot be met by the somewhat higher-grade but much more expensive leathers imported from the United States and Great Britain. Just how far this factory's output will affect the trade in imported leathers is problematical, but on the whole it is believed that it will not have any very unfavorable result. The quality of leather it is now producing suits the native trade to a very fair extent, and will doubtless take the place of the cheaper grades of upper leather imported from the United States. It is likely, however, that with this cheaper supply of leather available there will be an increase in the use of foreign-style leather shoes, with the result that demand for American and European leathers will centre on the better grades, and there will be little clashing of interest between the two lines of trade. In sole leather there will be practically no competition from American leathers; for almost no sole leather is coming into this field from the United States or Europe at the present time.

Imports of sole leather into Hongkong in 1919 were valued at $6,000,000 (approximate). Of these imports the larger portion comes from Singapore, with Indo-China, Burma, and Siam furnishing nearly the whole of the balance. A little high-grade sole leather comes from Australia, and a still smaller amount from the United States. The value of the imports of upper leather in 1919 was substantially $300,000, of which the United States furnished about 90 per cent., a little coming from Australia, India, and Indo-China.—U. S. Commerce Reports.

Motor-Vehicles in Siam

According to data published by the Bangkok customs, the number of motor cars landed at Siam during the last 10 fiscal years ended March 31, 1919, was 1,219 cars. Of this number 122 vehicles were imported from the United States during the first five years and 495 during the second five years. The number of licenses issued now exceeds 1,200, but the actual number of automobiles in daily use may not exceed 800. Most of these cars are for private use; comparatively few trucks or other commercial vehicles are employed, owing to the cheaper cost of transportation by water.

During the last five fiscal years American motor cars have practically dominated the Siamese market despite that, owing to lack of direct shipping facilities between Siam and the United States, their import was greatly hampered during the war by certain transhipment regulations at the ports of Singapore and Hongkong. In the fiscal year ended March 31, 1916, a total of 89 motor cars were landed at Bangkok, 70 of which were from the United States, 17 from the United Kingdom, 1 from Italy, and 1 from Singapore; in 1917 the total was 160 cars, 137 coming from the United States, 18 from the United Kingdom, 3 from Italy, and 2 from Singapore; in 1918, a total of 120 cars were imported, 102 from the United States, 14 from the United Kingdom, 1 from Italy, and 3 from Singapore; and finally, in the fiscal year ended March 31, 1919, the United States supplied 161 cars out of total import of 170 cars, 4 being supplied by the United Kingdom, 1 from Singapore, 1 from the Dutch Indies, and 3 from Hongkong. The aggregate declared import values during the respective periods were: 226,727 ticals in 1916, 519,845 ticals in 1917, 328,264 ticals in 1918, and 507,599 ticals in 1919. (Tical, at normal exchange, equals $0.3709 United States currency.)

The motor-cycle trade in Siam has not shown much progress during the last six fiscal years ended March 31, 1919; official import figures are not available for earlier years. The total number of motor-cycles imported for the six years was 277, of which 46 machines came from the United States, 184 from the United Kingdom, and 47 from all other countries. The number and declared value of the motor-cycles imported during each of the six years was as follows: In 1913-14, 57 machines, valued at 26,055 ticals; 25, value 12,504 ticals, in 1914-15; 37, value 20,893 ticals, in 1915-16; 41, value 21,364 ticals, in 1916-17; 92, value 52,334 ticals, in 1917-18; and 25, value 25,299 ticals, in 1918-19. Motor vehicles are not manufactured in Siam. As in former years the import duty remains 3 per cent. *ad. valorem.*

Wireless in Foreign Trade

BUSINESS men everywhere appreciate how sweeping the reversals have been in the pre-war status of domestic and foreign commerce. It is not yet fully realized, however, that perhaps the most significant of the striking changes is the new position which the United States has achieved in the field of overseas communication. A few years back America's standing was an inconspicuous one; now, through the development of a system of trans-oceanic wireless stations, this country has taken over the leadership in providing facilities for telegraphic connection with the principal world markets. It is no exaggeration to state that the recent expansion of wireless communication has ushered in a new commercial era.

When the globe-girdling chain of wireless stations was first conceived, industrial America was inclined to view the introduction of long-distance radio circuits as something of scientific interest; now the leaders in commerce are learning that world-wide wireless has arrived in time to help the nation's business out of a serious dilemma.

Just how vital is this new relation of wireless to trade has been made clear for readers of the FAR EASTERN REVIEW in a special interview with Edward J. Nally, president of the Radio Corporation of America. He noted that an entirely new set of commercial conditions for Americans have grown up out of the enormously expanded foreign trade which was forced upon the United States during the war. "Throughout the country," he observed, "there has been a great awakening. Eyes and thoughts are being cast overseas that never before extended beyond home boundaries. It is thoroughly realized now that it is only a question of time when American labor will be unemployed if the output of the greatly expanded industries is limited to home consumption. With ever increasing momentum a public sentiment is being created to demand foreign trade methods and facilities. Foremost is the crying need for an extension of facilities in the matter of quick communication between nations.

"Until world-wide wireless became an accomplished fact, American trade overseas was grievously injured and handicapped by the message delays which occurred with a cable system that had not been sufficiently improved and extended so that messages could be delivered and replied to promptly.

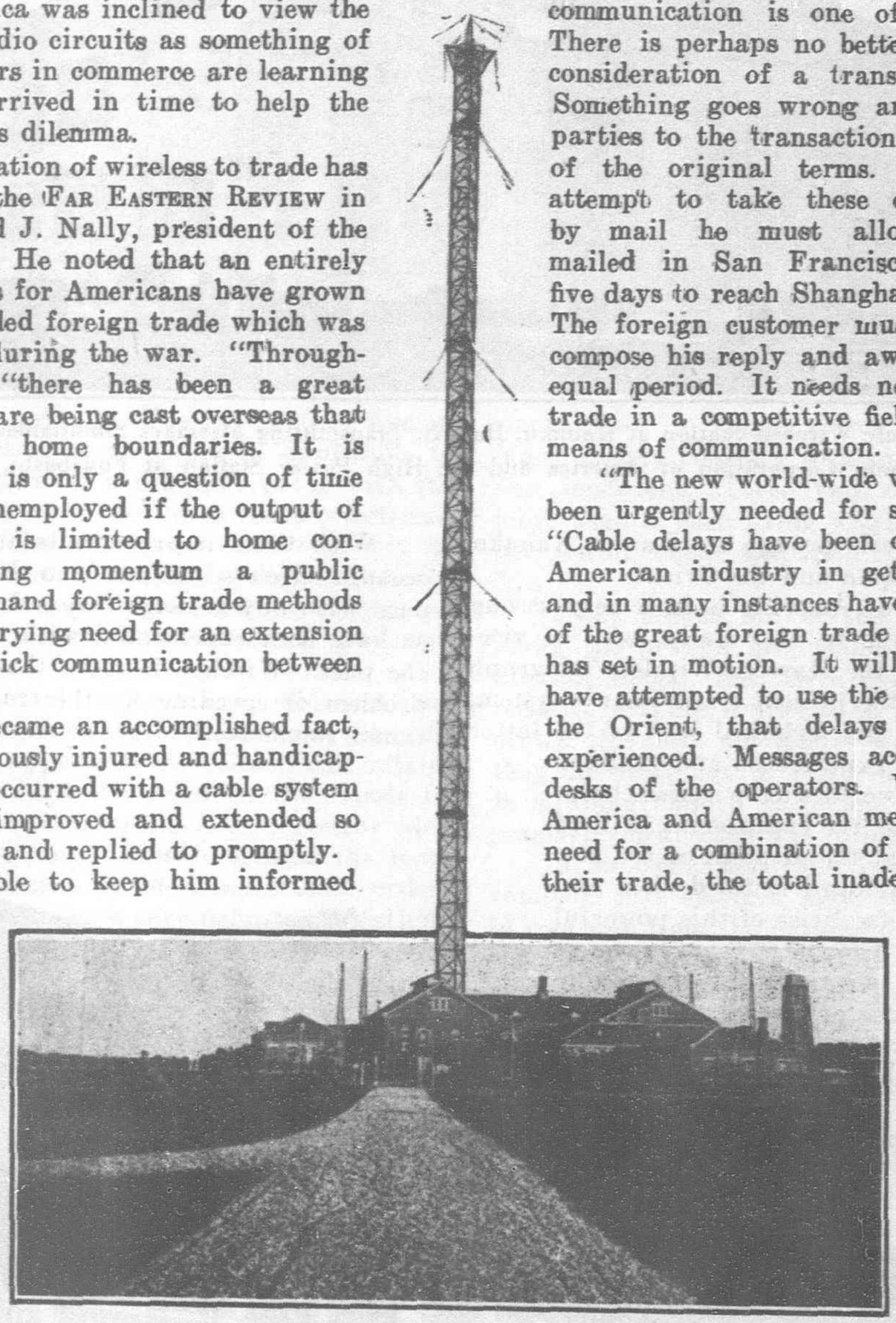
"The exporter needs the cable to keep him informed about his prospects. Foreign trade conditions are different from those of domestic trade. A modern exporter has to adjust himself quickly to ever-changing conditions. He has had to think by the cable; now he has a new channel of thought in the wireless."

Mr. Nally is a pioneer in telegraphic communication. From its earliest days he has played a conspicuous part in building up the land wire network, noting and keep a step ahead of its cumulative importance to commerce within the United States. His mind, however, is not on the past; he is visualizing the present and visioning the future. Development of domestic trade was the sole concern of Americans up to a few years ago; its stimulation was the task of the land wires. Now that foreign trade is a necessity to maintain the nation's augmented business capacity, wireless communication to foreign shores enters as the vitalizing factor.

"Differences of time and distance call for a very different set of trading conditions," observed Mr. Nally. "When a selling transaction is negotiated with a foreign customer it is invariably specified that the goods are to be delivered on a certain date, at an agreed upon price, and are to be paid for in a definite manner. When a mishap occurs and these carefully pre-arranged plans are set at naught, the American shipper cannot take refuge behind the explanation that the details of the bargain were upset by conditions beyond his prevision or control. The foreign customer sees only that important details of the transaction have been changed, subjecting him to a revision of the original intention. It is only natural for the customer under these conditions to impose innumerable and sometimes unreasonable objections to carrying through the transaction. In fact, it may be stated as a general condition that the seller is usually held accountable and is expected to be infallible.

"It is perfectly evident, therefore, that quick telegraphic communication is one of the essentials of foreign trade. There is perhaps no better way to illustrate this than consideration of a transaction in seasonable commodities. Something goes wrong and it is necessary for the two parties to the transaction to agree upon a modification of the original terms. Should the American exporter attempt to take these questions up in correspondence by mail he must allow twenty days for a letter mailed in San Francisco to reach Yokohama, twenty-five days to reach Shanghai and thirty-four days to Manila. The foreign customer must then digest the new proposal, compose his reply and await delivery of his letter over an equal period. It needs no argument to show that foreign trade in a competitive field becomes hopeless without quick means of communication.

"The new world-wide wireless telegraphic facilities have been urgently needed for some time," Mr. Nally explained. "Cable delays have been one of the greatest hindrances to American industry in getting back to normal conditions, and in many instances have entirely stopped the functioning of the great foreign trade machine which the United States has set in motion. It will be vividly recalled by those who have attempted to use the cable between San Francisco and the Orient, that delays of nine days were sometimes experienced. Messages accumulated and piled up on the desks of the operators. When one seeks the reason why America and American merchants are waking up to the need for a combination of interests to the end of conserving their trade, the total inadequacy of cable facilities is found to be a controlling factor."



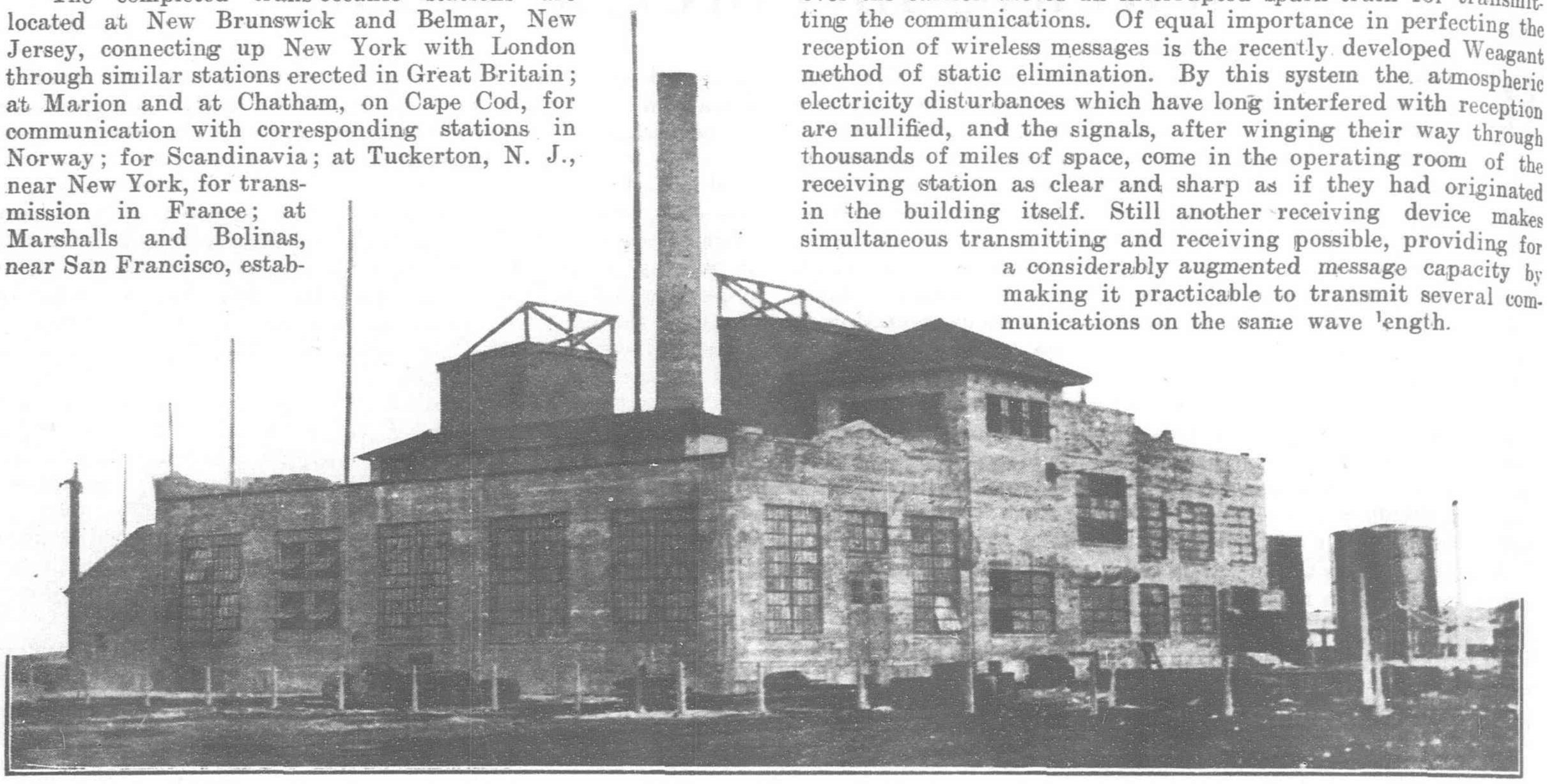
The trans-Oceanic Wireless Station of the Imperial Japanese Government located at Funabashi and communicating with the Stations of the Radio Corporation of America in Hawaii and California

Mr. Nally instanced the recent merger by which the stations and patents of the Marconi Wireless Telegraph Company of America and the radio rights of the General Electric Company were acquired by the Radio Corporation of America, as the most practical step yet taken to develop and extend communication to adequate proportions. The new company began business on March 1 with the most powerful and costly commercial system in the world.

Long-distance stations which had been erected before the war were put into immediate operation and established for the first time direct commercial radio communication between the United States and England. Since that date the Radio Corporation of America, now free from the governmental control exercised during the war period, has been able to go ahead with its comprehensive plan of linking up the principal trade centres of the world. Its immediate facilities are comprised in nine powerful stations in United States territory; another is now under construction in Argentina and, later, the system will be extended to Brazil, Uruguay, Paraguay, Chile, Peru, Ecuador,

Columbia, Bolivia, Venezuela, Mexico and the Central American republics.

The completed trans-oceanic stations are located at New Brunswick and Belmar, New Jersey, connecting up New York with London through similar stations erected in Great Britain; at Marion and at Chatham, on Cape Cod, for communication with corresponding stations in Norway; for Scandinavia; at Tuckerton, N. J., near New York, for transmission in France; at Marshalls and Bolinas, near San Francisco, establishing communication with Hawaii through stations at Kahuku and Koko Head, and thence to Japan and the Orient.

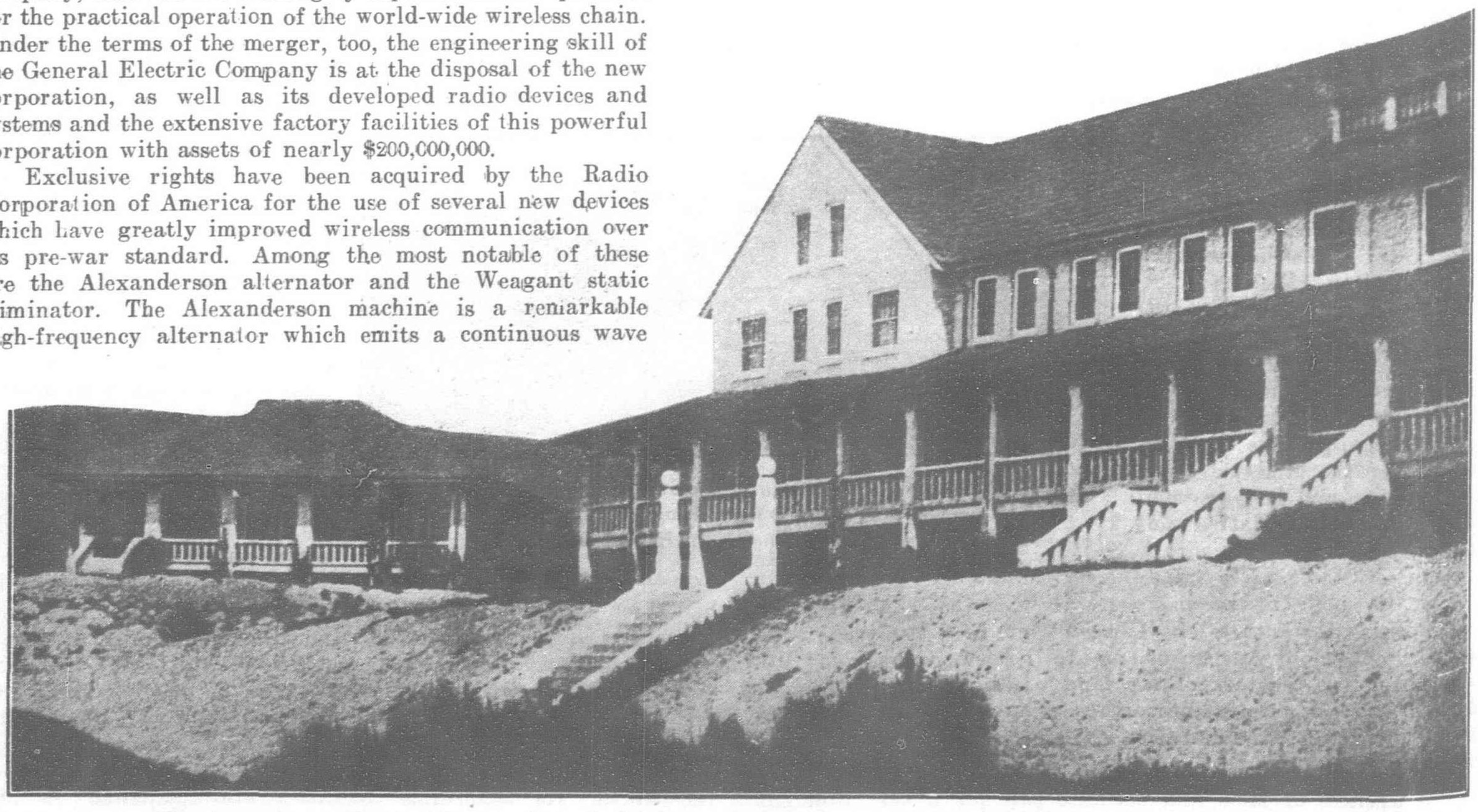


Power House of the trans-Oceanic Wireless Station at Kahuku, Hawaii, Transmitting Messages Simultaneously to the California Stations of the Radio Corporation of America and the High Power Station at Funabashi, Japan

The new Radio Corporation of America is in a very strong financial position, and in addition to Mr. Nally, who as vice-president and general manager of the Marconi Wireless Telegraph Company of America, developed the present trans-oceanic system, has taken over the entire official and technical staff of the latter company, men who are thoroughly experienced and qualified for the practical operation of the world-wide wireless chain. Under the terms of the merger, too, the engineering skill of the General Electric Company is at the disposal of the new corporation, as well as its developed radio devices and systems and the extensive factory facilities of this powerful corporation with assets of nearly $200,000,000.

Exclusive rights have been acquired by the Radio Corporation of America for the use of several new devices which have greatly improved wireless communication over its pre-war standard. Among the most notable of these are the Alexanderson alternator and the Weagant static eliminator. The Alexanderson machine is a remarkable high-frequency alternator which emits a continuous wave of radio oscillations upon which the signals of the message are imposed, providing a telegraphic method of great superiority over the earlier use of an interrupted spark train for transmitting the communications. Of equal importance in perfecting the reception of wireless messages is the recently developed Weagant method of static elimination. By this system the atmospheric electricity disturbances which have long interfered with reception are nullified, and the signals, after winging their way through thousands of miles of space, come in the operating room of the receiving station as clear and sharp as if they had originated in the building itself. Still another receiving device makes simultaneous transmitting and receiving possible, providing for a considerably augmented message capacity by making it practicable to transmit several communications on the same wave length.

With these improvements in use the capacity of the trans-oceanic wireless stations can be constantly expanded to keep pace with any message demands, and delays and congestion such as have been experienced with the cables will become a thing of the past. Wireless is more than a hope; it is the answer to the problem of speeding up the transactions of America's international commerce.



The trans-Oceanic Wireless Station of the Radio Corporation of America at Marshall, California, communicating with that Company's High Power Stations in Hawaii

This greatly improved service, too, has introduced lower rates, effecting direct savings in the conduct of business and enabling a more general and widespread use of telegraphic facilities for industrial transactions.

The factors of speed, increased reliability, accuracy, and lowered cost, however, have an economic importance far greater than is represented solely in the promotion of trade, according to Mr. Nally's viewpoint. World-wide wireless, as he conceives it, has opened the way to a new era in co-ordinating the interests of a reconstructed world, preparing a great channel for dissemination of national views and view-points and the cementing of closer relationships of the peoples of all civilized nations.

"The universality of wireless makes this practicable where it has never been possible before," explained the president of the Radio Corporation. "Desert, mountains, water and isolated communities are all accessible to the radio message; there is no place on the globe so remote that wireless cannot reach it. When our whole plan is fulfilled any character of service or any class of message will be available as it is called for.

"It does not take mature reflection to appreciate the importance of a low-priced telegraphic news service. Its influence on world progress is obvious at a glance. Take, for example, the special facilities of our trans-Pacific service. We all recognize that the Orient and the Occident are worlds apart. Yet the day has arrived when we must reach a closer understanding with these nations overseas, if only for the reason that America's sales to the Far East have increased four-fold and we are buying double that quantity in return. These new connections which have been established have only to be cultivated to be made permanent. Such cultivation obviously calls for more than ordinary business integrity and observance of the commercial equities; the problem reaches down into the soul of nations. The adage that human nature is the same the world over is not entirely applicable to the Orient; mental processes begin at a different point with the two races, they follow a different route and often reach a different conclusion. Reconciliation of the divergent views can only be brought about by a sympathetic understanding between Americans and Orientals. It is in the interpretation of the psychology of these nationals that wireless is destined to weild a powerful influence.

"The change will be brought about by many influences, but I would rate as of greatest importance the broader scope given to the newspaper press. We can appreciate how American affairs and American sentiments have been distorted in the minds of Orientals; it is equally clear that we have but a very sketchy idea of what they are thinking and doing. This is because the news received from both continents is usually of a sensational order. The high cost of cable transmission places very definite limitations on the number of words a newspaper correspondent can send. Both sides of the story cannot be told; the conservative, and usually representative, thought of America must therefore be subordinated to the mere outline of the sensational act or occurrence which is the basis of the news item. With lower rates, lack of congestion, increased speed and reliability of transmission, world-wide wireless opens up a great channel for better understandings and a wider tolerance in matters which affect world destinities.

"The same principle obviously applies as well to straight commercial telegraphic correspondence," Mr. Nally concluded, "and to those who view the new communication facilities in this light, the fact that the system of the Radio Corporation of America has been thrown open to public service is nothing short of an epoch-making event."

Japanese Labor Century Behind

Drawing a parallel between the conditions in Japan at the present day and those in Britain at the beginning of the nineteenth century, Mr. Oswald White, Vice-Consul at Osaka, in a report on Japanese labor, says that in both cases the factory system was taking the place of the domestic system, and the attendant evils which are now coming into prominence in Japan are similar to those experienced in Britain a century ago. In the course of his report Mr. White says that Japanese labor is usually summed up as being cheap in price and poor in quality, and as a rough generalization this judgment may be accepted. The average Japanese workman, though short in stature compared with a European, is strong and well developed, and capable of working long hours at a stretch, though it is said he falls short of the European in the case of work requiring great physical strength and stamina. One of his merits has been described as obedience and his demerits apathy, the latter being probably largely the result of economic conditions. The long hours of the Japanese workman are discounted by the inability to concentrate. A prominent quality is the quickness to learn, but there is an absence of originality. The Japanese has been spoken of as matter of fact rather than practical. The standard of intelligence shown by the average workman is admittedly low. It could hardly be otherwise under present conditions.

Progress in connection with the factory system has been especially rapid in the last five years, and Japan is rapidly acquiring an important position among manufacturing countries. The supply of labor is plentiful, but skilled labor is scarce. A feature of Japanese industry is the quantity of female and child labor. The spinning and weaving companies employ 100,000 girls of whom a considerable number are children, as against a quarter that number of men. Similarly in weaving, all kinds, the number of women working in 1912 was stated to be 133,000 in factories and 205,000 in cottages, while the number of men was given as 15,000 and 11,000 respectively.

The Japanese workman works long hours—10 to 12 on an average—with few holidays. Casual labor is obtained from the so-called human market. In Osaka irregular workmen gather every day, and contractors come and collect as many men as are wanted for particular jobs The pay reserved in the various industries has increased steadily year by year, and during the war it nearly doubled. Unfortunately prices have risen too, and there is little doubt that in Japan prices have risen first and wages after. Many causes conspire to keep down wages. Labor is plentiful and inefficient. These two reasons prevent labor from getting more than a bare living wage. It is at this point that the competition of female and child labor and of the cottage industries is felt.

Trade unions are at the present moment non-existent, and under the present law would have little power if formed. They are not illegal, but there exists a clause in the law of public security making it illegal to instigate a strike. Liberally interpreted this does not hinder workmen from striking, and, in fact, they do strike but it hampers organized action. Moreover there is a well-grounded suspicion that the authorities have hitherto passively obstructed the formation of trade unions.

In his conclusions Mr. White says that the conditions are so complex that changes must come slowly. Nor would it be safe to conclude from the parallel drawn that they would closely follow the trend of events in Britain in the last century. The Japanese character is different from the British, and what is one man's meat is another man's poison.

Shipping Situation in Japan

Comments in the "Japan Chronicle" on the shipping situation seem to indicate a general depression, especially in the North American trade. This is evidenced by a reduction of from 10 to 30 per cent. in the freight rates of unsubsidized steamers, and the disengagement of their respective charters by 57 ships, during March and April. The forthcoming activity of the Osaka Shosen Kaisha, which has several large steamers under construction for use on its Tacoma-Hongkong-Manila run, is reported as being watched with interest by Japanese shipping men, in view of the pessimistic forebodings due to the growing amount of idle cargo space. On the other hand the "Japan Advertiser" and the "Japan Gazette" do not seem to think that the supply of tonnage space will exceed the demand, during the next few years, at least. In the latter paper an official of the Nippon Yusen Kaisha is quoted as saying that this company must increase its fleet to participate in the activities anticipated in oriental waters, and has decided to build 60 freighters and 7 passenger boats within the net five years. That company has decided, according to the "Japan Advertiser," to replace the branch line that has connected Japan with the South Sea Islands, with two monthly services, both starting from Yokohama, one going to the eastern and one to the western part of the South Sea Islands, formerly belonging to Germany, and occupied during the World War by the Japanese Navy. Another development in trans-Pacific service is the inauguration by the Mitsui Bussan Kaisha of a run between Dairen, Japan, and Seattle, to supersede the present irregular service. Until May the company will send a vessel every two months, after which time a regular monthly service will be maintained.

Road and River Improvement in Shantung Province

Civil Governor Sets Out a Notable and Ambitious Program

IN a recent issue the FAR EASTERN REVIEW announced the development of an ambitious program of road and river improvement work for Shantung Province, China. Details have since been issued and we take the following from the "China Press," of Shanghai:

One of the most far reaching as well as the most daring programs ever presented to any province in China is Civil Governor C'hu Ying-kuang's plan of building 4,000 *li* of automobile roads and of deepening the Hsiao Ch'ing River.

Mr. T'ang En-liang, a graduate of Purdue University in Civil Engineering and at present on the staff of Shantung Christian University, has been appointed to take charge of the Bureau of Roads and Waterways. At present Mr. Tang has two parties of ten men each surveying roads in and around the city of Tsinan.

If this scheme is actually carried out in its entirety, it will bring about an economic transformation of Shantung. First of all, it will weave all the important cities of the province in a unified transportation net. Under existing conditions many of the important cities, as for example Chefoo, are hamstrung economically, because they lack adequate land transportation facilities.

But far more important than connecting the chief cities is the fact that such motor truck roads and the deepening of the Hsiao Ch'ing River would break the backbone of Japan's economic domination in Shantung. At present Japan has a monoply of the existing railway facilities in the eastern half of the province. Even if the Chinese themselves should build the proposed Chefoo-Weihsien railway, both the railroad and Chefoo would still be at the mercy of the Japanese. Governor Ch'u's proposed scheme of automobile roads touches the sea at three different points, Lung K'ou, Chefoo and Hai Yang, and connects with the Tientsin and Pukow railroad at a point not yet definitely determined. With these motor truck roads in operation even a novice will see that Japan can no longer hold an economic dagger at the throat of the Chinese merchants, manufacturers and mine owners in the eastern part of the province.

To Deepen River

Even more important, perhaps, than the building of the roads is the deepening of the Hsiao Ch'ing River. With characteristic keenness Governor Ch'u says "Since the building of the Chiao-Chi railroad these districts are dependent upon this river for transportation in competition with the railroad. Therefore, the improvement of this river so as to make steam navigation possible must not be delayed." In the November, 1914, issue of the FAR EASTERN REVIEW Bronson Rea first advocated this plan as a means of checking Japanese aggression in the province of Shantung. The Governor has adopted Mr. Rea's suggestion.

The appended map and a translation of the Governor's plan bring out the salient points of the proposed program.

1. The lines of communications of the whole province should be so improved that the railroads, waterways, commercial ports, sea-ports, all the districts producing important commercial products, and all the places of military and naval importance may be connected by roads fit for heavy motor trucks. A necessary preliminary step is investigating the conditions to determine which shall be trunk lines and which shall be branch roads.

Railroad Plans

2. The Chiao-Chi (Shantung Railroad) and Tsinpu (Tientsin-Pukow Railroad) railroads serve the districts east, south, and northwest of Tsinan as convenient lines of communication. The districts west of Tsinan such as Tung Ch'ang and Lin Ch'ing, the Tsao district southwest of Tsinan, the Wu Ting district due north of Tsinan, the Li-I district southeast of Tsinan, the Teng-lai, Lungkow and Huanghsien districts and all the districts along the sea coast northwest of Tsinan are too far from the railways and the waterways. Some of them are several and others tens of days distant from Tsinan, in consequence of which political progress as well as commercial and industrial development lag deplorably. These are matters of the greatest importance. In determining the trunk roads and the branch roads, the above mentioned districts shall be considered the starting points.

3. The seven trunk lines of the province are to be designated as follows:—

(*a*) The Lungkow-Weihsien trunk road (Lungkow, Huang Shan-kuan, Chu Ch'iao, Yie Hsien, Sha Ho, Ch'and I, Weihsien).
(*b*) The Chefoo-Weihsien trunk road (Chefoo, Fu Shan, Ch'i Hsia, Lai Yang, Ping Tu, Ch'ang I, Weihsien).
(*c*) Weihsien-I Hsien trunk road (Weihsien, An Ch'ui, Chu Ch'eng, Chu Hsien, Lin I, I Hsien).
(*d*) The T'ai An-Yen Pien trunk road (T'ai An, Hsin T'ai Mang Yin, Lin I, Yen Pien).
(*e*) The Tsaohsien-Tsining trunk road (Ho Pien, Ho Chei Ting T'ao, Wu Ch'eng, Chin Chiang, Ta I Chi, Tsining).
(*f*) The Ping Yuan-Tsining trunk road (Ping Yuan, En Hsien, Kao T'ang, Ch'ing Ping, Poa Ping, Liao Ch'eng, Tung Chao Chia Lou, Yellow River Ferry, Tsining).
(*g*) The Ch'ang I-Ping Yuan trunk road (Ch'ang I, Shou Kuang, Kuang Lao, Pao Hsing, Kao Yuan, Ch'ing Ch'eng, Chi Tung, Yellow River Ferry, Shang Ho, Lin I, Ping Yuan).

Branch Lines

4. Ten branch roads branching from the above mentioned seven trunk lines:—

(*a*) Branch of the Lungkow-Weihsien trunk road (From Huang Shang to Chao Yuan).
(*b*) Branch of the Chefoo-Weihsien trunk road (From Lai Yang-Hai Yang-Weihaiwei to Wen Tong).
(*c*) Branches of the Weihsien-I Hsien trunk line:—
  i. Chu Hsien to I Shui.
  ii. Chu Hsien to Er Chao Shi Chui Shoa.
(*b*) Branches of the Tsao Hsien-Tsining trunk road:—
  i. Ts'ao Hsien to Ch'eng Wu.
  ii. Fu T'ai to Chin Hsiang.
  iii. Yai I Chi of Chin Hsiang—Yun Ch'eng to Pu Hsien.

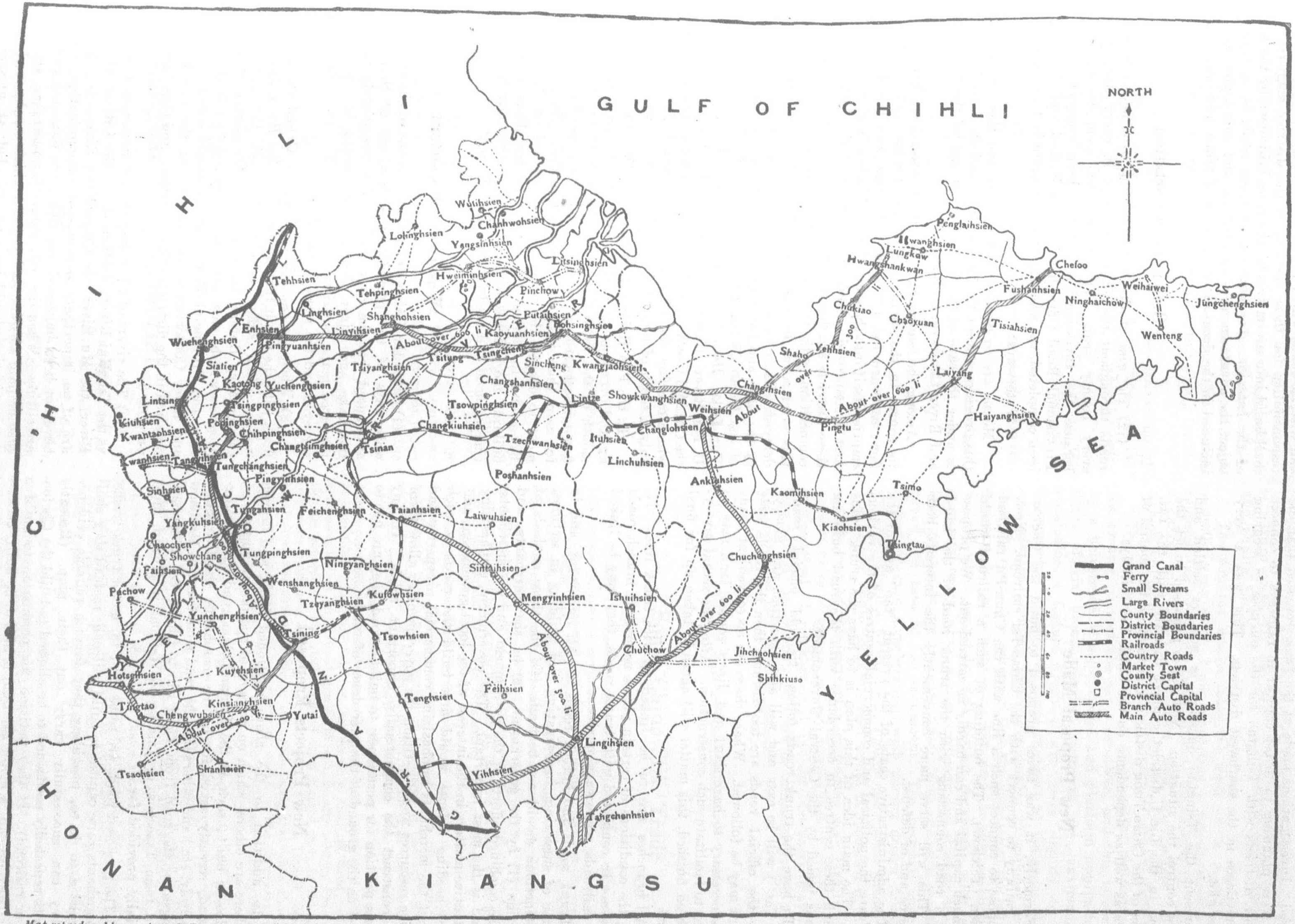
5. The above mentioned trunk and branch roads make a total of about 4,000 *li*. The surveying should be undertaken in sections and finished without delay. An investigation of the business conditions and of the places needing defense is to determine which roads are to be built by the government, which by the merchants and which by the joint efforts of the merchants and the government. The building program is to be pushed as rapidly as possible. A map of the various trunk and branch roads has been prepared and is open to inspection. The details for carrying out the work cannot be decided until the surveying and the necessary calculations have been finished.

Reasons are Given

The reasons for the trunk and branch lines are as follows:—

(1) For the Chiao Tung districts, thickly populated and rich in resources, and the districts along the coast line and bearing on the problems of defense, where formerly the merchants planned to build the Chefoo-Weihsien line, we think that there should be two trunk lines. We are not concerned at present with the places on the sea coast having water communication.

(2) In the Ts'ao Hsien and Tsining districts southwest of Tsinan and bordering on the provinces of Anhui, and Honan, owing to the extreme importance of communication and defense in these regions, the trunk line should have numerous branch lines to ensure convenient communication facilities.



Map reproduced by courtesy of "The China Press," Shanghai.

Map Showing Contemplated Road and River Improvements in Shantung. The program is a far-reaching one and, when carried out, will bring about an economic transformation of Shantung.

(3) The original provincial plan for the Chiao-I line has disappeared. Investigations made at the time, revealed that the Germans were planning to invest capital in railways to connect the Chiao-I districts with Tsingtao for the purpose of securing special privileges in the southwest districts. This was a very dangerous plot.

At present the Tsingtao question is not yet settled and foreigners control the situation. Now, it is proposed to let the trunk line in the Lin-I district connect directly with the two trunk lines of the Chiao Tung districts so as to avoid the control of foreigners as well as dependence on the Chiao Tsi railways.

New Proposal Made

(4) Formerly, it was twice proposed to build the Chefoo-Weihsien railway to connect with the Chiao-Tsi railroad. Now, some propose to connect such a line with the Chun-Pu railroad at Teihsien (Teichow). The building of such a railroad would require much capital and can hardly be carried out. We propose to build a road connecting with the trunk road of the Lin-I district. This will serve more conveniently the interests both of commerce and of defense.

(5) The administrative seats of the present "tao" and of the old "fu" are the political and commercial centres of the various districts. The main idea of this plan is to have the trunk roads go through these centres in accordance with the road building regulations issued by the Central Government.

(6) To have the trunk roads follow the old official roads ("Kuan Tao") will be easy and will also save time and money. In case the official roads are too distant, then the roads most convenient may be followed. Where there are no convenient roads and it is necessary to have short and direct routes, land may be purchased to facilitate such construction. After the actual surveying has been finished, this matter will again be taken up for final settlement.

(7) All branches are to be linked up with trunk lines. If, however, the conditions of certain places necessitate branch roads which cannot be connected with trunk roads, they may be linked up with railroads, waterways or rivers.

(8) Trunk roads and branch roads are all important, and in the matter of surveying, investigating and building in sections. such distinctions should not be made. Of the three methods of construction (1) by the government, (2) by the merchants, and (3) by the combined efforts of the government and the merchants, the second is the most important. The government emphasizing administrative matters in the interest of the local government and of places needing defense would first build the roads at such places, but the merchants emphasizing commercial prosperity and productive resources would petition the government to allow them to first construct the commercially important roads. If any merchants petition for permission to build a road, they are not to be denied on the ground of the precedence of roads.

New Projects Proposed

(9) In addition to the above mentioned trunk and branch roads, there are others, which on account of special circumstances, must also be built; such as the Tsinan-Lokou road, the Ch'ing-Ts'ao road, recently asked for by the merchants, the Poa Shan light railway, etc., and others like the road from Lin-I to Hsuchow in Kiangsu, or the road from Tung Lin to Chang Tei in Honan, the road from Tsaochow or Tsining to Weihuei in Honan, must be specially provided for.

(10) The proposed roads are to be built for motor truck traffic, but if merchants raise capital to build railroads instead they shall be permitted to do so, providing they furnish reliable evidence that they can successfully carry out their plan. (Recently merchants repeatedly petitioned to be allowed to build the Chefoo-Weihsien railroad). If they petition for permission to build a light railway instead, a motor car road is also to be built, because a light railway issued only for the transportation of goods and cannot be used for the transportation of troops or for travel.

(11) Besides the trunk and branch roads, there are the country and district roads which are of importance to agriculture. The responsibility for these rests upon the district magistrates who shall build in conformity with the rules laid down by the Ministry of the Interior. The building of these roads is to have as its object the advancement of agriculture, and such highways are not included in the program of building of trunk and branch lines.

Better Transportation

(12) The aim of this road building program is to construct roads throughout the whole province, in every district and to every county seat. If some districts seem disregarded, it is because the investigation has not been completed. After the Provisional Road Office has been established and the survey has been completed, the whole matter will again be taken up.

B Waterways:

Means are to be devised for improving the various rivers of this province, except the Yellow River and the Grand Canal which is under the care of the River Bureau and of the Nan-Yun Lake and River Conservancy Bureau.

Among the remaining rivers the Hsiao Ch'ing River which has its source in the springs of Ch'ang Ch'ing and Li Ch'ong and flows eastward fod 400 *li* through more than ten districts till it empties itself into the sea at Yang Chin-ken in Shou Kuang, should first be improved. Since the building of the Chiao Tsi railroad these districts are dependent upon this river for transportation in competition with the railway. Therefore, the improvements of this river so as to make steam navigation possible, must not be delayed. Examine appended map. (The survey was carried out by the Lake and River Conservancy Bureau). On the South bank of the Hsiao Ch'ing River, there are the Yu Fu River, the Pei Yun Lake, Hsin Chiang River, Ch'ing Ho Creek, Ma Ta Lake, U Pei River, Hsiao Fu River, etc. On the other bank there is the Chi Mei Creek. All these are either water reservoirs or swamps which overflow the Ch'i Tung and Chang Ch'ui districts so that only a tenth of tons of thousands of acres produce any crops.

In the Poa Hsiang district the Chi Mei Creek constantly silts up and overflows its banks. The Nan Wu dyke was built at the mouth of the Ts'ao Chia Creek to prevent the flood water from flowing eastward. Now, since the dyke is not in repair, the fields for more than 40 *li* are constantly flooded. The plan of improvement to deepen the branches and the bed of the Hsiao Ch'ing River and to control the current by installing more locks and building more dykes so that these streams may be controlled in time of flood and used in seasons of drought.

Waterways Important

(1) Since the Hsiao Ch'ing River is one of the most important waterways of the province, the Ministry of the Interior has announced that the river ought to be immediately improved and the Lake and River Conservancy Bureau has made a survey, prepared maps and issued a report. The river should again be surveyed and the work undertaken.

(2) When the rainfall is heavy the Grand Canal easily overflows with the result that the people of Tei Hsien and surrounding regions often suffer heavily. Although the Lake and River Conservancy Bureau has considered this matter it is feared that progress will be slow and completion indefinitely delayed. Therefore, the Provincial Road Bureau should consult with the Lake and River Conservancy Bureau so that the Canal shall first be repaired in the districts subject to floods and thus further disasters prevented.

(3) The rivers of Shantung are too numerous to mention, such as the Tsu Hai River, Ta Wen River, the I River, the Wei, the Mi River, the Mu River, the Chao Wang River, etc. Although they are of no importance as means of communication, for years they have not been improved, the dykes are damaged and the streams are silting. When the river survey is undertaken, attention should also be paid to these and streams which can be used as means of communication should be improved, but at present it is very difficult to present a plan for the improvement of these streams.

Production of Abaca in the Philippines

It is the intention of the Philippine bureau of agriculture to immediately launch a campaign against the production of the low grades of hemp, unless the present market conditions materially change, and the quotations for the grades J-K-L and M are commensurately in proportion to the prices being paid for the better grades.

Present conditions indicate a decrease in the production of abaca fibre for 1920 as compared with that of 1919. However, the 1920 production will greatly depend on American market conditions. Should high prices rule, many of the abaca laborers who have turned their attention to the production of other export crops where they are assured a better return for their labor, may again be persuaded to return to the abaca fields.

The production of abaca in the Philippines by grades for the month of January, 1920, was as follows:

MAGUEY.

Grade.	Bales.
1	331
2	6,023
3	3,823
D	283
Total	10,469

TAGAL BRAID.

Grade.	Bales.
AA	57
BB	121
CC	79
DD	28
EE	000
Total	285

Grade.	Number Bales.
A	8
B	244
C	1,001
D	2,727
E	7,579
S1	1,807
S2	4,217
S3	3,370
F	10,595
G	4,994
H	2,221
I	12,313
J	22,836
K	9,198
L	9,825
M	3,217
DL	291
DM	185
OYT	1,957
Total	98,585

Fifty-one bales of machine cleaned Maguey and 197 bales of retted Sisal complete the list.

The primary object in the passing of the fibre law and the establishment of regulations governing the classification and the baling of Philippine fibres was to in directly assist the producers of Philippine fibres by giving them more accurate information regarding the proper method for the preparation of their fibre for the market and by establishing uniform grades to give them more accurate data on market conditions so as to enable them to judge which grades they could more economically strip according to the prices being paid for the different grades.

No uniform standard of grades existed prior to January 1, 1915, and for this reason it was impossible for the producer to know what type of fibre he should strip in order to get the maximum return for his labor.

Mr. Don D. Strong, fibre expert for the bureau of agriculture, is devoting most of his time in an effort to untangle the Philippine hemp knot.

Shanghai War Memorial

The Shanghai War Volunteer Memorial Committee met in the Municipal Council room, Shanghai, on May 1, to receive the report of the advisory committee of architects—Messrs. S. J. Halse, R. C. Turner, and H. F. Boissezon—in connection with the competition for a memorial design. Four sets of drawings were submitted, and one set of models, and the committee unanimously adopted the architects' recommendation that the awards be made as follows:

First prize, Tls. 750, Messrs. Stewardson and Spence.

Second prize, Tls. 500, Messrs. Graham Browne and Wingrove.

Third prize, Tls. 250, Mr. A. Llewellyn Taylor (Messrs. Arts and Crafts, Ltd.).

The winning design takes the form of a massive granite pedestal some 40 ft. high supporting a bronze statuary group representing victorious Peace offering consolation the widows and orphans with other decoration, and appropriate inscription (which will be in Latin), with space for the Roll of Honour.

The monument rests upon a raised paved platform covering the greater part of the space available, and this is surrounded by a balustrade of solid design and platform approached by a flight of six broad, shallow steps, of the maximum length obtainable, a feature which always gives dignity to such a monument. In order to make the most of the space obtainable and also to form an impressive bastion of support as viewed from the river, it is suggested that the east face of the balustraded enclosure be carried out some feet over the sloping bund face, a feature which might be still further developed with a broad segmental bulge, which would emphasize and strength the podium to a greater degree from the water front and give greater space round the base of the monument. The material suggested is Honan or Hongkong granite, with paving design delineated in the two materials which are of lighter and darker shades of grey. The figures would be bronze and would be modelled in Europe.

The cost of this memorial, depending very largely upon the present price of bronze, is only approximately given, and as the emblematical figures suggested by the designers may have to be modified; an estimate will not be announced until the matter has been gone into in more details.

South China Silk Trade

Silk export returns from the South China field for the calendar year 1919 promise a marked improvement in this trade in the near future. In the first place silk rereeled according to American ideas on the system known as the "Grant reel" has been produced in considerable quantities, with the result that practically the whole of such silk was taken up by American buyers at prices ruling considerably higher than those obtained for silk of ordinary Chinese reels. During the year, also, the Comite International pour l'Amelioration de la Sericulture dans le Kwangtung at Canton completed a series of tests extending over all the year's crops, which have proved that if the Pasteur process of eliminating silkworm diseases be carried out on a comprehensive scale a very large increase in production, as well as a very marked improvement in the quality of the silk, may be counted upon in South China. This international committee was inaugurated upon the initiative of the French Chamber of Commerce at Canton, but the result of its work will be of particular benefit to American importers, since the improved method of reeling mentioned is in line with their efforts.

American demand controlled the silk trade of the whole of South China during practically the entire year. The new season commenced with a burden of something like 5,000 bales of last season's silk on hand, which was composed almost entirely of grades of silk usually sold in France and in Europe generally. The slack demand from Europe early in the season led reelers to produce a larger proportion of silk for the United States than usual from the midseason crops, the result being that when Europe finally came into the market it was short of stocks. The comparatively high exchange for silver as against the franc and pound sterling also affected the demand from Europe very seriously.

The total exports of raw silk during the season are placed by the Canton Chamber of Commerce at 57.030 bales, as compared with a total of 40,313 bales for 1918, the exports to Europe showing a decrease of 1,870 bales, while those to the United States showed an increase of 18,587 bales. Exports of waste silk for the season are placed at 29,448 bales, as compared with a total of 41,386 bales in 1918, exports to Europe showing a slight increase, while those to the United States showed a marked decrease. Exports of pierced cocoons for the year are placed at 5,701 bales, as compared with 7,426 bales in 1918, shipments to both Europe and the United States showing a decrease. During the year Japan took 2 bales of waste silk and 1 bale of pierced cocoons, as compared with 4 and 16 bales, respectively, in 1918.

The calendar year 1920 opens with a prospect that the whole of the current season's production will be cleared by the beginning of the new season in May, although continued high exchange and the prospect of silver remaining at its present level make the purchase of Chinese silk for the American market a matter of great difficulty because of unprecedented gold costs.

Across the Gobi Desert by Packard Car

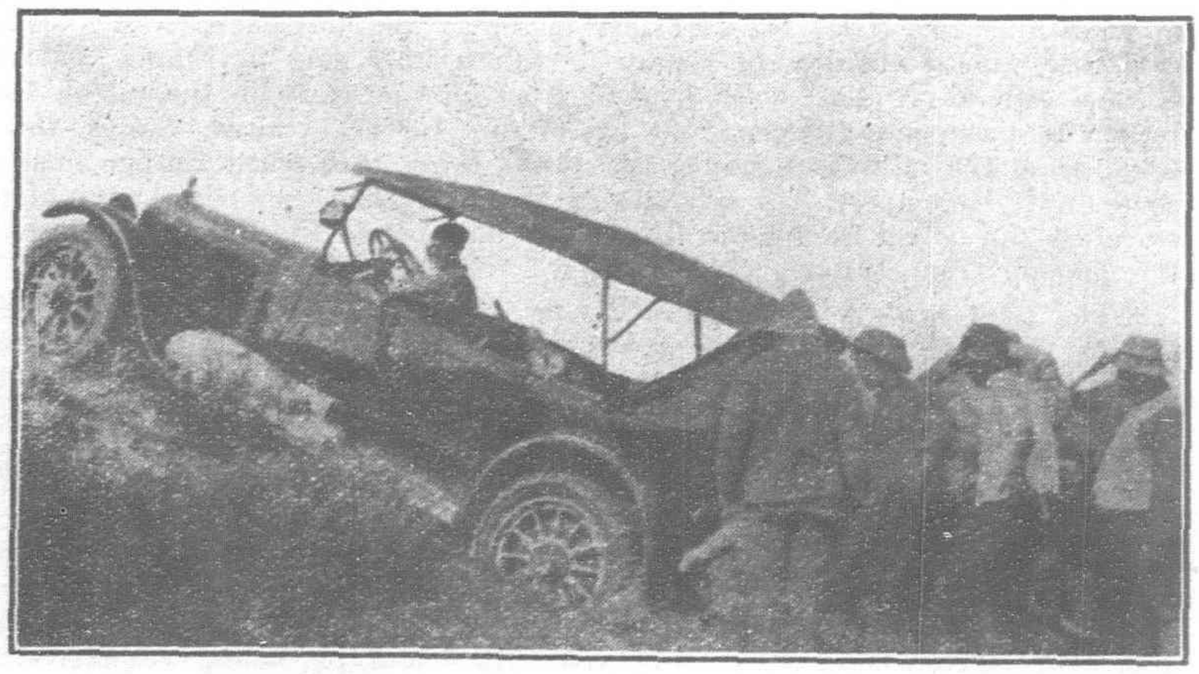
A STRIKING proof of how the automobile is opening up territory that has been hitherto shunned by all but the most daring explorers, is shown by the recent trip over the Gobi Desert by two Packard Twin Sixes, according to the report received by the Packard Motors Export Corporation.

These two cars were part of a party of five cars and two trucks which left Tientsin for Urumchi, about 2,000 miles west of Tientsin by caravan trail, to prove that motor transportation was possible and that goods could be brought from the interior to the market in a much more efficient manner than could be obtained through the use of camels and other beasts of burden. Lieut. George Moskovski, formerly of the Polish Army, was in charge of the trip, and to him are we indebted for the story.

Making a So-called Road Passable.

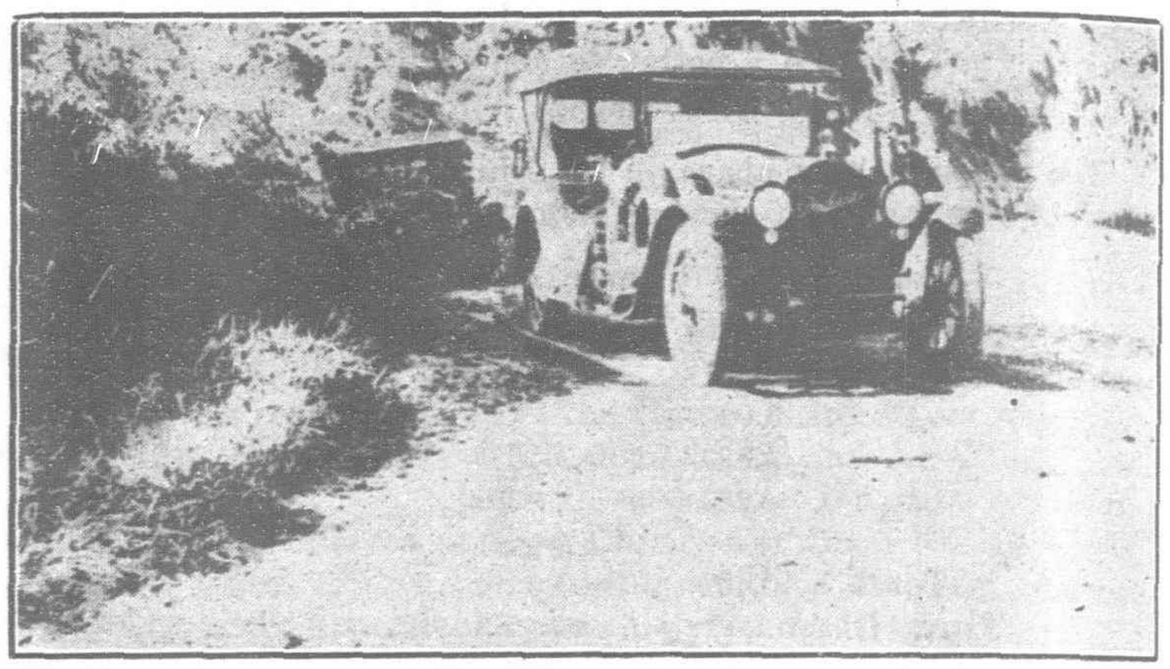
The good roads, if they may be dignified by that term, ended at Kweihwacheng, and three cars and the two trucks were forced to put back. The two Packard Twin Sixes, however, continued, and made the entire trip without serious accident. Both carried trailers. They were followed at several days interval by camel trains which carried supplies for the return trip as gasoline stations are not exceptionally numerous in Western Mongolia.

The trail proved very uneven, being for the most part tortuous, rocky and indistinct. Often the cars travelled along dried river beds where innumerable boulders proved a great handicap. Long stretches of deep sand added to the difficulties of motoring, and in one instance, the sand was so deep that one of the trailers had to be abandoned.



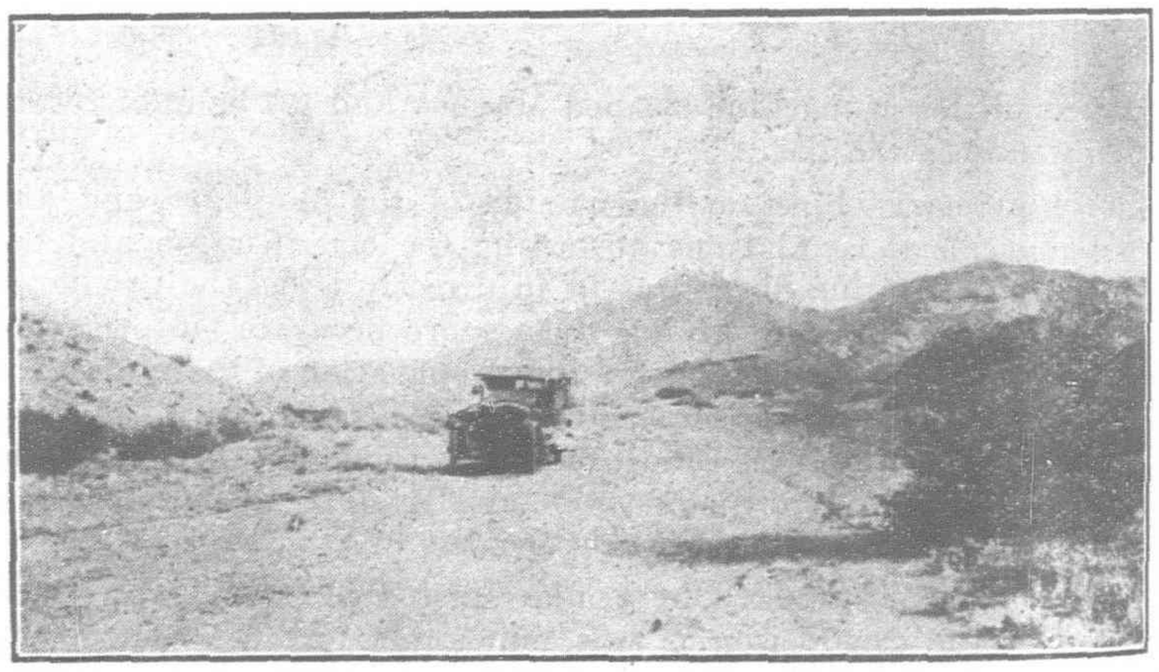
Stuck in the Sand 300 Miles from Kukuirgou.

At a point about 700 miles west of Kukuirigou, and 300 miles north of Kanchow the motorists found themselves confronted by a long range of mountains and sand hills through which the guide was unable to discover a pass. As this region was the very heart of the desert and practically uninhabited, there was no one to turn to for further information, and the few natives seen fled precipitately from the "devil wagon." Eventually, a pass was discovered and the party proceeded.



One Machine Helps the Other Out of a Sand Hole.

In speaking of this region Lieut. Moskovski says "In some places there was no sign of human habitation for hundreds of miles, nothing but a bleak, barren expanse of table land." The road through this region, however, proved surprisingly good, and game was plentiful. In spite of the handicap of the trailers the two cars finally reached Urumchi about two months after leaving Tientsin.



Rocky Country on the Return Trip.

The actual travelling time was, of course, but a small fraction of this period. The cars were unquestionably the first motor vehicles ever seen by the natives, and in most cases their mere appearance inspired a terror that would have been highly amusing were it not for the difficulty of securing information that ensued.

The same hazardous features were encountered upon the return trip, except that the tourists had the advantage of knowing the trail and the obstacles before them.

The trip proved that while it is entirely possible to substitute the motor car for the "ship of the desert," the old methods will likely continue for sometime, as only a car of the very highest quality and with a super-abundance of reserve power can stand up under the trying conditions of the trip.

An interesting feature of the trip is that five sets of tire chains were used up, yet the original set of Goodyear cord tires lasted throughout the trip.

Engineering, Financial, Industrial and Commercial News

RAILWAYS

Revenue of Japanese Railways in April.—The Japanese Government Railway reports that during April, on all the State lines, 5,314,658 tons of cargo were carried, the revenue of the freight service having come up to Y.11,682,170. The daily average of cargo carried was 177,155 tons. Compared with the corresponding date of last year, the daily average shows an increase of 5,400 tons. The revenue shows an increase also of Y.389,406 per diem.

New Line Projected from Sunning City to Hoi An City.—Mr. Mak, a wealthy Cantonese merchant from the Straits Settlements, proposes to float a company for the construction of a branch railroad from Sunning City to Hoi An City.

Japanese Railways Improvement.—The Japanese railway board has decided to start the work of doubling the present two track road on the Tokyo-Kobe line at the coming fiscal year to be finished in seven years.

The Japanese Government announces that the Arima Light Railway has been nationalized and transferred to the control of the Government Railways. The purchase price was Y.384,772.35, for which the Government has delivered to the company operating the line public bonds the face value of which is Y.434,800.

Proposal to Have Russian Financiers Superseded by Japanese in Ping Hei Railway Loan.—On account of the Chinese Government's reported proposal to have new arrangements in the Ping Hei Railway Loan, which was formerly concluded between the former Russian Imperial Government and China, with a view of introducing Japanese financial aid, certain members of the Senate made a vehement protest against the step to be taken.

Dr. C. C. Wang Takes Over Management of Chinese Eastern Railway.—Dr. C. C. Wang, former director of the Peking-Hankow line, formally assumed his duty as Chinese resident manager of the Chinese Eastern Railway. His duty is to co-operate with M. Pimenoff, the Russian manager, in matters concerning the administration of this Sino-Russian line in North Manchuria. General Pao Kuei-ching left Kirinfu on April 22 for Mukden for consulting with General Chang Tso-lin about military preparations along the Chinese Eastern Railway for the protection of Chinese and foreign residents within its zone and the establishment of a Manchurian Bank for Fengtien, Kirin and Heilungkiang jointly. The capital will be subscribed by the three provinces.

Chinese Financiers Urge Redemption of Railways Under Foreign Control.—Liang Shih-yi and the Chinese financiers connected with his Five Families Bank, the strongest native banking group in North China and a candidate for admission into the New Consortium, if that group is ever formed, are urging upon the Government the redemption of those national railway lines still under partial foreign control. Liang and his friends guarantee that the funds necessary for this purpose can be obtained from his group and from other prominent Chinese bankers.

It is Liang's plan to begin with the redemption of the Peking-Mukden Line, on which only $1,500,000 is due to the British interests which financed its construction. Other lines financed by foreigners and now under partial foreign control will be redeemed later.

Officials at the Ministry of Communications, while in sympathy with the scheme, express doubts as to whether it can be realized. Aside from the financial obstacles in the way of putting it through it is believed that the foreign interests concerned will not agree to it. Their contracts have in most cases, a number of years to run, and there is little likelihood that they will consent to forego the privileges accruing them from these contracts.

COMPLETE JAPANESE-AMERICAN ACCORD

Carried Back to the United States by Thomas W. Lamont—Financial Consortium Attains Practical Shape After a Year of Discussion and Delay.

A complete and satisfactory agreement has been reached as to the political and other features of the Chinese Financial Consortium which have been subjects of discussion between the bankers and governments of Japan and America since the new Consortium was organized at Paris in May, 1919. Japan's special rights are fully recognized and at the same time care has been taken to conserve the rights of China within her own national domain. To assist in perfecting the understanding and to secure the necessary international team-work, Ambassador Morris has accompanied Mr. Thomas W. Lamont, head of the American group, on his return to the United States.

All concessions and options in China possessed by each banking group are pooled, except those upon which substantial progress has been made. Borrowing is limited to the Chinese central government, provincial governments, and to corporations guaranteed by the central or provincial governments. Loans for individuals or private enterprise do not come under the purview of the Consortium. Equality of opportunity is guaranteed, irrespective of the amount of money raised from time to time in any particular country.

Federated Malay States Railway Expansion.—The appropriations for extending the service of the Federated Malay States Railway, which involved about $54,000,000 in 1919, are apt to be considerably increased this year. Contractors are already working on new wharves and harbor improvements at Prai, the terminus of the railway system at the settlement of Penang, where the doubling of the line and other alterations will mean an approximate expenditure of $1,700,000 in 1920. Another work that has been recently sanctioned is the construction of a causeway across the Straits of Johore, at a cost of $1,500,000. A further sum of about $1,135,000 will be spent to double the line and erect a new station, godowns, etc., in Singapore. The work on the line from Pasir Mas to the Siamese border, which it is expected will be completed next year, will involve the expenditure of over $2,500,000 in 1920. Through train service to Siam was inaugurated in July, 1918, which has evidenced that a considerable trade will be forthcoming when the shortage of rolling stock is relieved, and add materially to the importance of Penang as a terminal port for international commerce. In 1918 the gross receipts of the railway were about $7,000,000, and the net profits $1,800,000.

New Electric Railway.—At Odaru, Hokkaido, a new electric railway is being laid by the Hokkai Chuo Electric Railway Company, projected by Mr. Kei Isono and other local businessmen. According to the charter granted by the Government Railways recently to the company, the projected line is 27.40 miles in length, connecting Temiya, Odaru, with Nashima Park at the outskirts of the town. The gauge of the line is 3.6 feet. The company plans to build the line at the expense of Y.7,000,000.

Chinese Protest Against Proposed Mine Railway.—The provincial assembly of Shanhsi has sent in a despatch to the civil governor concerning the alleged granting to the British firm, Peking Syndicate in Peking, the right of building a railway from Chinghua in Honan to Tsechow in Shanhsi for the development and transportation of iron and coal minerals. The memorialist say that through the Peking-Hankow and other railway, the vast mineral deposits of this province can be exported to other provinces and also to foreign countries and that if so, the mining and transportation interests will be entirely in the hands of foreigners.

Further, in accordance with the stipulations of the purchase agreement signed between the province of Shanhsi and the Peking Syndicate about ten years ago when the British interests consented to restore their railway and mining concessions to the people of Shanhsi, all railways in connection with mines must be built by the natives with pure Chinese capital. The central government are requested to take note of the above-mentioned purchase agreement.

SHIPPING

New Australia-Japan Service.—It is understood to be the intention of a Japanese firm to commence a shipping service between Australia, China, and Japan. Negotiations are proceeding for the establishment of the line, which, if successful, will lead to a direct service between Melbourne, Sydney, and Queensland ports and the East.

It is expected that important developments will occur in the Eastern trade. The purchase of the E. and A line by the Lord Inchcape combine has led to a revival of this company. Already the new interests have decided to obtain additional tonnage. Negotiations are now proceeding for the employment of other vessels.

New Dutch Shipping Company.—A shipping company has been formed entitled "The Society of United Dutch Shipping Companies," with a capital of two hundred million guilders. The new concern will operate under the names of the "Holland-East Asia," "Holland-British India," "Holland-Australasia" and "Holland-Africa" lines.

Dollar Company Starts First American Boat on Yangtze Service.—The *Mei Chuen*, 300-ton steamer, recently purchased by the Robert Dollar Company, sailed from Shanghai some time ago as the first of what is hoped to be a regular line of American cargo and passenger steamers on the Yangtze River service. The dimensions of the *Mei Chuen* are as follows: length 190-ft., breadth 30-ft., depth 8-ft. It carries 300 tons of cargo at 5 : 10 draft and was built for the Yangtze service. Its passenger capacity is 17 first, 42 second and 180 third. The speed is 13½ knots. The ship was purchased from the Standard Oil Company.

American Shipping Companies in the Far East Combine.—The United States Shipping Board Trans-Pacific Conference, composed of the shipping companies employing vessels allocated by the Shipping Board, has been organized, with headquarters in Shanghai and with the head office for Japan in Kobe. The chief aim of this new combination of American shipping interests in the Far East is dependable freight service and dependable freight rates.

Mr. R. O. Baker will be chairman of the conference for Japan, with offices in Kobe. The following operating lines are members of the combine: Struthers and Dixon, Robert Dollar & Company, Pacific Mail Steamship Company, The Admiral Line, Los Angeles-Pacific Navigation Company, and Frank Waterhouse & Company.

New Line from Hongkong to Havana.—The establishment of a line of steamers for a service from Hongkong to Havana will play a large part in the development of the China rice trade in Cuba and the West Indies, where Chinese rice is one of the staple foods of the islands. China in return is a vast market for Cuban tobaccos and cigars, and the new line will make possible an increased reciprocal trade at a reduced cost because of its directness. The Southern United States will also be given an outlet to foreign trade in China, as New Orleans has been selected as a port of call for vessels on the return trip.

New Freight Service Coming to Far East.—The Green Star Line plans to run a weekly service from Baltimore. It is believed that the first steamer will be despatched immediately. As far as known the new line will be composed of United States Shipping Board ships. The first to leave will be *Eurana*, followed by the *Lancaster*, *Canivas*, *City of Omaha*, *Chipchung* and the *Maine*.

The ports of call in the Far East will be Yokohama, Kobe, Shanghai, Hongkong and Manila. When these ships begin to arrive at Yokohama, in addition to those already operated by the Green Star Line and the Admiral Line, it is more than probable that more records will be broken in regard to the number of steamers calling at that port.

T.K.K. to Operate a Line to Portland.—The Toyo Kisen Kaisha is planning to open a new freight service to Portland, Oregon, according to a statement made by Mr. S. Hara, chief of the Navigation Department of that company.

Mr. Hara says that the recent improvements made by the city of Portland in the harbor and in the facilities for quick handling of freight have been an inducement to open up a line from Japan to that port. Previously the long run up the Columbia River and the difficulty in crossing the bar at the mouth of the river had been obstacles to the establishment of a regular line and only tramp steamers have made occasional calls.

The present plan is to have a monthly service over a triangular route. The Japan port will be either Kobe or Yokohama, and the ships will call at San Francisco on the outward voyage and sail from Portland direct to Japan. If business warrants and freight offerings are sufficient, San Francisco will be dropped and a direct line to Portland will be operated. Passengers will be carried if the line is a success.

The first steamer to be despatched is the *Koyo Maru*, an 8,000-ton steamer, about the first of August. Two 10,000-ton freighters are now building at Tsurumi which will be ready to sail on schedule. In addition to the steamers for the Portland run, six other 10,000-ton freighters are now being built for the T.K.K. but it has not been definitely decided as to where they will run.

The South American line is to be increased by the addition of three steamers of the type of the *Anyo Maru* and having a tonnage of 18,000 tons. These are also on the ways at Tsurumi and when they are completed, monthly sailings to South American ports will be inaugurated. At present the schedule is one steamer every two months.

SHIPBUILDING

Launching of New Japanese Battleship.—The new Japanese battleship *Mutsu*, 38,000 tons displacement, construction of which was begun in 1918, is to be launched at the Yokosuka dockyard on May 30.

Launch at Hongkong.—The steamer *Szechuen* was launched at the Taikoo dockyard on May 8. The vessel has been built to the order of the China Navigation Company for coast trade between Hongkong and Shanghai.

O.S.K. Will Reconstruct Boats on Formosa Run.—The O.S.K. which for many years has been operating a weekly service between Kobe and Formosa has decided to improve the boats used on that run. About Y.1,000,000 will be devoted to making the *Hongkong* and *America Maru* two of the finest boats in the passenger service on the Far Eastern runs.

The *Hongkong Maru* will be docked at the Mitsubishi dock in Kobe and will be completely refitted. It will take about five months to overhaul the vessel and as soon as it is completed the *America Maru* will be taken off the run and refitted.

The *Kasudo Maru*, which is at present on the South American run, will replace the *Hongkong Maru* while the latter boat is being reconstructed.

Development of Nippon Yusen Kaisha Fleet.—The Nippon Yusen Kaisha has ordered two passenger steamers of a superior type from Glasgow. Shortly after announcing a plan for building or buying 500,000 tons of freighters and passenger ships during the next five years, the company ordered two freighters of 8,000 tons gross each from the Mitsubishi Shipyard and also three freighters of a similar size from the Yokohama Dockyard. The passenger ships now ordered from England are to be used for the inauguration of an express passenger service between Nagasaki and Shanghai. The two passenger ships will each have a capacity of 4,500 tons gross, with a speed of 18 knots. Their price is believed to be between Y.500 and Y.600 per ton.

In pursuance of the programme for the construction of 500,000 tons of new ships, the Nippon Yusen Kaisha has also contracted to buy three freighters—one of 6,400 tons deadweight from the Uraga Dockyard, and two of 11,000 tons deadweight each from the Yokohama Dockyard Company. The Uraga ship is valued at Y.325 per ton and is to be delivered next July; the price of the two other ships is Y.320 per ton, one to be delivered in September and the other in October.

INDUSTRIAL

Growth of Cotton Spinning Industry in Nagoya.—Many of the cotton-spinning companies have increased their capital since the beginning of the year, and many more plan to increase their output by establishing new mills, according to a translation from the Nagoya "Shin-Aichi Shimbun" transmitted by American Consul H. F. Hawley. Owing to the high price of land and the shortage of power in Tokio and Osaka, the attention of concerns intending to build new mills has been turned toward Nagoya and its suburbs, which offer superior advantages both in point of power supply and transportation facilities.

Capital Increase for Oji Company.—The Oji Paper Manufacturing Company will refer to a semi-annual meeting of shareholders to be held in the Imperial Japanese Railway Association a plan for increasing the company's capital from Y.25,000,000 as at present to Y.50,000,000 by the issue of new shares to the company's shareholders.

Flour Factories in Japan.—It is reported that in April the number of Japanese flour manufacturers was 19,074, which was an increase of 1,195 over the same time last year. Their estimated production was 740,850,000 *kin* valued at Y.98,174,000. Compared with the previous year, the volume of production shows an increase of 12.5 per cent., but the value shows such a big increase as Y.32,270,000.

Promotion of Industry in China.—The Chinese Ministry of Commerce and Agriculture and the Ministry of Finance are jointly considering plans for the organisation of a National League for Promotion of Industries. Tentative plans are suggested as follows:—

1—From April this year to February next year preparations will be made and in March the League will open for regular work.

2—The headquarters of the League is to be at Tien Tan, the Temple of Heaven, a fund of three millions will be appropriated from the Bureaux of Communication, Salt, Revenue and Tobacco and Wine.

3—The League will have a president and several vice-presidents, who will be selected for their ability and reputation, irrespective of party affiliations. There will be one Chief Director and several assistant Directors. Liang Chi-chao is said to have been selected as chief director.

Philippine Hemp Rope Factory at Amoy, China.—A new industrial venture for Amoy is the establishment at Siang-Am, on Amoy Island, of a Philippine hemp rope factory, controlled by Chinese with Philippine interests. The capital is said to be $120,000 silver, and the initial output will be 2,600 pounds per day, to be increased, if the demand warrants, to a possible maximum capacity of 14,000 pounds. It is thought that although the cost of production will be about the same as in the Philippines the Chinese company will be able to compete successfully in the local market, as there will be no transportation charges to pay on the finished product. The plant, which has been

Keeping Far Eastern Trade Channels Open

The service which the Irving's Foreign Division provides for merchants and producers in the Orient covers the full range of business and personal requirements in international banking. To facilitate export and import operations and to supply the financial needs of individuals, the Foreign Division

Sells checks and makes cable transfers
Issues commercial credits against exports and imports
Collects clean and documentary drafts
Provides facilities for American credit inquiries
Offers counsel on market conditions in America
Supplies emergency aid in handling shipments

***And*—when sales are completed and shipments have been made, the Foreign Division purchases approved bills of exchange in dollars or in Far Eastern currencies, covering goods actually sold to responsible buyers.**

IRVING NATIONAL BANK

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under construction for the past six months, is equipped to manufacture all classes of rope now on the market from the thinnest up to about 3½ inches in thickness. The machinery, tools, and equipment are of American manufacture, having been purchased through agents in the Philippine Islands.

AVIATION

Aviation in China—Peking-Tientsin Flight.—A Handley-Page aeroplane journeyed from Peking to Tientsin and landed on the Racecourse on May 7. There were 14 passengers on board, including the British Minister, Mr. B. F. Alston, C.B.

American Aviation Concern in China.—It is reported that American capitalists had subscribed $600,000 to establish an aviation company in Hongkong, to be called the Far Eastern Aviation Transportation Co. The regulations provide for its registration in Hongkong; for the establishment of a route from Canton, via Hongkong, Swatow, Amoy, Foochow, and Ningpo, to Shanghai; for a route from the Philippine Islands, via Formosa, to Foochow; and for the carrying of passengers and mail. It is anticipated that the annual net profits will approximate $200,000.

Anglo-Chinese Aviation Co.—A scheme is said to be afoot among British capitalists for the establishment of an Anglo-Chinese Aviation Company. According to the present programme, it is reported, lines are to be established between London and Shanghai via Egypt, Bombay and Hongkong. It is estimated that a flight between London and Peking will take four days and eight hours.

HARBORS

A Harbor Map of Shanghai.—A new map of the Shanghai Harbor has been compiled from the surveys of the Whangpoo Conservancy Board and published by that body. The map is an exceptionally fine piece of work. Each section of the harbor with its moorings is shown in considerable detail, all the wharves, godowns and factories on either side of the river and also the river training works.

Conservancy Work at Canton.—During recent months the work of conservancy has been carried on a considerable length in the Canton district. Many of the old dikes has been repaired and raised, unnecessary bends taken away, and new dikes constructed in their place. One continuous reconstructed dike now borders the right shore of the East River from Paklinwoo to Sheungnam, a distance of 10 miles. Altogether, 12 miles of dikes are now completed. Only lack of funds prevents the Conservancy Board from opening up work on a larger scale after the rainy season is over. With the present funds at their disposal the Board contemplate work at Lupao in the North River the next dry season with which it is hoped to control the waters that flood Canton.

Development of Amoy Harbor.—Extensive developments at Amoy including improvement of the harbor, building of a system of piers that will be connected directly with the Amoy-Changchow Railway and the repairing and extending of this railway are to be carried out in the coming months and will have the effect of adding vastly to the importance of the Fukien port, now given over almost exclusively to imports. A new source of coal from undeveloped fields ultimately to be tapped by the rail line is a detail of the general scheme which is being carried out by the Chinese government. Under an agreement that has been reached the railway is to be restored to commercial uses and a link extending the line on to Changchow is to be built at once. This is for a distance of 12 miles. About eight miles on beyond Changchow is an area rich in coal that has had little or no development and a plan to extend the railway to this coal field is under consideration. A project also has been advanced to swing the rail line southward with the purpose of connecting in time with the southern system of government rail lines in Kwangtung province. The necessary funds have been made available for the construction of the line and the carrying out of harbor improvements. A pier system will be established on the mainland not far from the railway station. A new reinforced concrete wharf is already being constructed for the railway. It will carry three tracks of railway lines and be completed in about 18 months. The competition of the work will vastly increase commerce between Fukien province and coastal points in China, providing export cargo for connections already established with Formosa, Hongkong, the Philippines, Indo-China and as far south as Singapore in addition to the coastal trade in China. With the completion of the pier system vessels up to 3,000 tons will be enabled to dock at piers and connect directly with the rail line.

Harbor Improvements in Manila.—The Governor-General of the Philippines has been authorized to float bonds to the amount of P.12,000,000 in the United States, the funds to be used for the improvement of Manila Harbor.

New Wharf Office Building for Dairen.—The new elegant wharf office building now in course of construction at the south of the present Wharf Office, on Dairen Wharves, will be finished by about August and will be occupied by about October.

To Link Singapore with the Malaya Peninsula.—On May 1 the Governor of the Straits Settlements tipped the first load of granite into the Johore Straits at Johore for the causeway to be constructed between Singapore and the mainland.

The New Port of Lungkow.—A sub-customs station has been established at Lungkow on account of the completion of the cement wharf built by Andersen, Meyer & Company. Both foreign and native steamers, under one thousand two hundred tons, can discharge their cargoes at the new wharf without using sampans hereafter. The Chinese merchants say that Lungkow will become one of the best sea ports of north China in the course of the next decade if both official and merchants pay attention to develop it in competition with the Japanese at Tsingtao in the future.

Shipbuilding Yard for Antung.—It is proposed to construct a suitable dockyard just below the Japanese Settlement, on the bank of the Yalu River, at Antung, and there regularly to construct auxiliary powered sailing vessels of several hundred registered tons suitable for plying to Japan, Korea, and North China.

A New Port at Hulutao.—The Chinese Government has decided, it is reported, to commence the work of constructing Hulutao into a commercial mart in August this year. A sum of $5,000,000 has been voted for the expenses to be incurred in this undertaking, and the Central Government and the Fengtien provincial authorities will raise the funds jointly.

Proposed Harbor Improvement in Japan.—The Moji Harbor Construction Company has just been floated at Moji with a capital of Yen 10,000,000. The new company proposes to construct harbor accommodations along the most advanced lines.

The municipal authorities of Amagasaki, a rapidly-growing commercial and industrial town, between Osaka and Kobe, are elaborating plans for establishing harbor facilities. So far the authorities have decided to erect two dockyards, specially adapted for accommodating coasting ships of about 300 tons.

Opening of Taku Port Delayed.—The opening of Taku as a sea port having been sanctioned, the River Conservancy Department is reported to be clearing the water ways. Owing to the lack of funds, the programme will have to be delayed.

ELECTRICAL ENTERPRISES

Japanese Trams Transport Millions.—According to recent investigation by the Tokyo Electric Bureau, the number of passengers carried last year on Tokyo trams was 395,199,539. Gross receipts were Y.17,128,677.19, and the total distance travelled was 45,827,528 miles. This is an increase of 58,495,816 passengers and Y.2,581,581.22 over the previous year.

New Chinese Wireless Plant.—On account of the large number of troops stationed at Tunghsien in the vicinity of the Metropolis the Chinese Government has recently made a proposal to erect a wireless station there in order to facilitate the transmission of intelligence. It is learnt, says the "North China Standard," that the Japanese firm of Mitsui Bussan Kaisha have undertaken to erect the wireless station for a sum of twenty-five thousand dollars for which an agreement has been already entered into by the two parties.

Mr. Ho Yam-tang, the promoter of the proposed Electric Company at Shatao, Namhoi District, has already raised $20,000 of the capital required.

A New Electric Company for Canton.—$20,000 have been raised already for the proposed Electric Company at Shatao Namhoi District.

Chinese Wireless.—The Chinese wireless stations were opened on May 1 for the transmission of commercial and news despatches. The rate per word to be charged is declared to be the same as that through the telegraphs. The Peking press expresses the hope that this will add to the country's facilities of communication, because the land wires have long been a disgust to the public.

New Wireless Station in Japan.—The new wireless offices at Fukushima prefecture, Japan, were opened for business in May. The dispatching office at Hara-machi will for the present be used for receiving purposes only. The receiving capacity of the offices is estimated at 500 messages daily. The opening of the new stations is expected to relieve much of the congestion in telegraphic circles, especially between America and Japan.

Mono-Rail Service Proposed for Tokyo.—To relieve the congestion of travelling in Tokyo and as an auxiliary to the municipal electric car service, several business men of the capital, including Mr. Yoshio Naito, have approached the Government for permission to build a mono-rail electric tramway over the rivers and canals in Tokyo.

The scheme proposes to start the line near Shimbashi, over the canals, thence over the Sumida River as far as Yoroibashi, near the Stock Exchange. The terminus will be Tabata on the Government railway. Each car will be capable of accommodating 50 persons and will be run at an average speed of about 25 miles per hour. The proposed company is to be capitalized at 15,000,000 yen. The estimated cost of building the line is about Y.1,630,000 per mile.

Progress of Electrical Development in Japan.—Seven separate concerns applied for permission to develop power from the Hida River, in the vicinity of Nagoya, and representatives of them all are considering the organization of the Hida-Gawa Electric Co., to be capitalized at $14,955,000. Another combine reported from the same source is the unification of the power supply of Nagoya and neighboring districts under the control of the Nagoya Electric Light Co., which has bought half of the shares of the Bishu Electric Co., and is negotiating to secure control of the Ichinomiya Electric Light Co., the Inazawa Electric Co., the Gifu Electric Co., and the Yokkaichi Electric Co. As a result of the efforts of the governor of Miye Prefecture representatives of six big electric companies in Miye Prefecture, the Hokusei, Iwakura, Tsu, Matsuzaka, Ise, and Toba, have been in consultation in regard to a possible combination of all the electric companies within the Prefecture, to be capitalized at $4,985,000. With the double purpose of obtaining additional income and of controlling water rights, the authorities of Toyama Prefecture are contemplating the establishment of a large hydroelectric plant under Prefectural administration, to develop 37,000 kilowatts of power from the Joganji River. It is expected that this will be sufficient to supply all present demands for power within the Prefecture and leave a surplus to be sold to Kyoto and Osaka. Another power company recently organized in this district is known as the Etchu Electric Power Co., having been granted a license to utilize the Wada River, from which it is expected to develop 10,000 kilowatts of power.

High Speed Electric Line Tokyo-Yokohama.—Two years hence the journey between Tokyo and Yokohama, which at present takes some forty minutes by electric train, is expected to be reduced to 20 or 25 minutes on the completion of the projected new high speed electric railway between Shibuya and Yokohama. The work of construction will be started next August at the estimated cost of 20 million yen by the Musashi electric company and be completed in a year and a half, the line being expected to be open to traffic about May 1922.

PERSONAL

Mr. J. Paul Jameson has been appointed first American Consul at Kalgan.

Baron Hayashi to go to London.—Viscount Chinda will shortly be relieved of his duties as Ambassador to Great Britain and will be succeeded by Baron Hayashi according to the Japanese press. Baron Hayashi is at the present time the Governor-General of Kwantung.

The retiring Ambassador to London has been abroad in the diplomatic service for the past 10 years and has made a request that he be relieved and allowed to return home, as his health is somewhat impaired.

Outside of a short time in Rome, the diplomatic service of Baron Hayashi has been in the Orient and his appointment to the important post at London is regarded as a well-deserved recognition of unusual merit.

EDUCATIONAL

Salt College to be Established in China.—The Central Salt Administration has obtained the permission of the Government to establish a Salt College, similar to those established by the Postal and Customs Authorities. The College will soon commence work and an entrance examination will take place for those who desire to join the college. There will be a special class, in which only those who have been sent to the Central Salt Administration by the Cabinet after passing the civil examinations will be admitted, but this class should be limited to twenty persons. After taking the prescribed course these special students will be given important appointments in the provinces. Ordinary candidates will be taken from among those who successfully pass the entrance examination, and after graduation these students will be given appointments either in the Salt Commissioners' Offices or the District Inspectorates. A notice has been issued by the Administration to the effect that 50 students who possess diplomas of Middle Schools will be admitted after examination. Twenty of them will be put in the Preparatory Class and every year new students will be taken. No recommendation letter will be considered, but only those who are properly qualified will be admitted.

Schools for Children of Railway Employees in China.—The Board of Railways Educational Department has opened one higher and 14 primary schools at various stations along the Peking-Mukden, Tientsin-Pukow, Peking-Hankow and Peking-Suiyuan lines for the education of the children of Government Railway employees. Plans are laid for the opening of a railway technical school next year. Mr. Yeh Kung-chow, former Director of the Peking-Kalgan Railway, proposes to establish an Academy at Tientsin to enable the students of the above schools to pass through a higher course.

National Educational Convention to be Held in Canton in October 1920.—The Civil Governor of Kwantung Province has promised to appropriate the sum of $3,000 to the Education Association for defraying the expenses of the preliminary meeting which will be held early in June for the purpose of preparing everything thoroughly before the National Educational convention, will be convened in Canton on October 10 next

CONSTRUCTION

Fuller Company of the Orient in Harness.—The George A. Fuller Company of the Orient, a subsidiary of the George A. Fuller Company of New York, has been organized in Japan and already has contracted to build two big office buildings in Tokyo for the Nippon Yusen Kaisha and the Nippon Oil Company, and will be two of the largest buildings in Japan. In the construction of these buildings the new Fuller company will use the modern machinery that is now being used in the United States and in Europe. These buildings are to be completed within two years and will do much to relieve the present shortage of office room in Tokyo. Colonel William A. Starrett, vice-president of the Fuller Company of New York and a director of the local Fuller Company, said to a representative of "The Japan Advertiser" that he found conditions in Japan very favorable for the establishment of an American construction company. "The Fuller Company now has a large organization in Japan," he said, "and has incorporated a Japanese company to carry out the two large contracts it has already undertaken, and to seek new business in Japan. We have found the Japanese sympathetic to our project. There has been much speculation as to how the Japanese workmen would take to our American methods. Everything that we can observe indicates that they will easily learn our methods and will quickly adapt themselves. Altogether we view the whole labor situation with confidence. We are in Japan to stay and hope from now on to be identified with the Japanese forward movement in all things industrial. The organization of the Japanese Fuller Company will be augmented by additional principal men as the requirements arise. Further, we are building a large supporting organization in America to attend to the prompt execution of orders for such parts of the buildings as will be purchased in American or European markets."

Big Building Program at Yokohama.—Yokohama is planning an extensive building program for the coming year. According to the plans made public by the mayor of the city, there will be 8 new school houses erected, one library, one municipal isolation hospital, a tubercular hospital and 200 dwellings. In addition to these there will be a new public market. The municipality has appropriated Y.3,000,000 for the carrying out of the program.

New Bridge Needed at Tientsin.—It appears to the "North-China Daily Mail" that the time has come for the Chinese and Foreign Consular authorities of Tientsin to come together and consider the advisability of replacing the present International Bridge by a more modern and convenient structure. The present bridge is entirely inadequate for the work which it is called on to do and at times it is positively dangerous to make a crossing by ricksha owing to the automobile and other traffic which it is required to serve.

MINING

Mining Industry in Chosen (Korea).—The mining industry in Chosen has developed much in recent years. Prior to the war there was little or no transportation of minerals by rail in Chosen, but since 1914 the export of minerals has become so brisk that the total quantity transported amounted to 137,600 tons for last year.

Netherland East Indies Discovery of Copper.—Rich copper deposits have been discovered in South Timor, in the neighborhood of the village of Taninj, about 20 miles distant from Tjamplong. The copper ore is described as worth from 250 to 400 guilders a ton (£25 to £40 at present exchange), and to be the richest copper ore in the world. Tjamplong is connected by a motor road with Koepang, the capital of Dutch Timor, which is about 30 miles away, but a road will have to be continued from Tjamplong to the mines.

Exploitation of Gold in Manchuria.—Two preliminary Agreements between Chinese and British interests for the development of gold-mining properties in Northern Manchuria have recently been concluded. The agreements are now awaiting sanction by the Ministry of Agriculture and Commerce at Peking.

These documents contain further evidence of the present tendency to develop mining properties on a co-operative basis rather than on the concession principle. They also indicate the possibilities of a new mining industry open to British participation in Manchuria.

Both Agreements relate to gold-mining property on the Chinese or right bank of the Amur River,

both within the Homalo district. The Agreements provide for the supply of labor and macninery and for the distribution of the gold on a basis of 50 per cent. to the owner and 50 per cent. to the contractor. The agreements are for five years from the commencement of the operations of each plant to be provided. At the expiration of this period the complete sets of machinery are to be handed back to the owner in good and working condition without any claim for compensation on the part of the contractor.

Mining in Japan.—The yield of minerals in Japan during March was very favorable, according to a report from the Japanese Mining Bureau issued on May 7. Gold, iron, coal, and sulphur registered a more or less tangible gain, only copper, petroleum and silver showing a decline.

The yield of gold in March amounted to 169,590 *momme*, which was an increase of 2.8 per cent. over the corresponding period of last month while silver registered a decline of 3.2 per cent., its yield being 3,590,204 *momme*.

The yield of copper during March fell away by 10.5 per cent. The recent increase in wages and other sundry working expenses caused mine operators in Japan to curtail their production as much as possible with the result that in March a big decrease was registered. The total yield for the month amounted to 9,910,859 *kin*.

Iron is reported officially to have shown a gain of 60.8 per cent., the month's yield being 7,772 metric tons. The yield of petroleum amounted to 155,558 *koku*, being a decrease of 0.8 per cent. compared with the corresponding month of last year.

The yield of coal in March amounted to 2,404,363 metric tons, which was an increase of 0.3 per cent. Sulphur increased by 4.1 per cent. over the corresponding month of last year, the month's yield being 3,531 tons. Evidently, this increase in sulphur was caused by the recent advance in the price in the domestic market.

The result of the mining activities during the first three months of the present year was also as favorable as that for March. Sulphur showed an increase of 14.8 per cent. over the same period of last year, the total yield amounting to 9,923 metric tons. Petroleum also reached 470,845 *koku*, being an increase of 2.9 per cent. over the corresponding months of 1919.

The yield of coal amounted to 6,492,389 metric tons, being an increase of 0.2 per cent. Iron also increased by 10 per cent., its yield being up to 18,827 tons.

Copper registered a decrease of 6 per cent., the total yield being 28,922,693 *kin*. This decrease is largely responsible for the importation of electro copper from the United States which has been increased steadily since last year. The yield of silver amounted to 9,858,187 *momme*, being a decrease of 5.2 per cent. from the corresponding period of last year. The total yield of coal amounted to 501,011 *momme*, being a decrease of 0.1 per cent. from the corresponding period of last year.

New Coal Mining Concern in Japan.—A big coal mining combine capitalized at Y.50,000,000 has been consummated for the purpose of taking over 18 coal mines of Kyushu, the chief coal-producing centre of Japan proper. These mines now produce a total of about 850,000 tons of coal, and the company holds other mineral concessions in Kyushu. The Asia Coal Mining Company represents 2,500,000 shares of stock at Y.20 each, all to be fully paid immediately.

Mining Syndicate for North China.—A mining syndicate has recently been formed in North China with a total capitalization of $10,000,000. The principal shareholders of the syndicate are Tsao Ju-ling, and General Tuan Chi-kuei.

Mindanao Coal Fields.—Mindanao will very soon be supplying a large part of the Philippine Islands' demand for coal. A seam of the best anthracite coal 8-ft. 4-in. thick has been uncovered at the works of the National Coal Company, Malangas, the railroad is nearing completion, and within two months the company will be transporting coal to tidewater at Malangas. The work of developing the coal fields has been primarily hampered by many difficulties, but the outlook now for an early and large supply of coal is most promising. Malangas is on the east side of the Sibuguey peninsula. A town was constructed at Malangas with a waterworks system, wharf, electric light plant, hospital, etc. The wharf has thirty feet of water alongside and the harbor is protected in all weather. A railroad was started to Butong, a camp about twelve kilometers from Malangas. The prospects at Butong are the best yet found in the district. Gotas is four kilometers southwest of Butong. Gotas is the last camp up the Sibuguey river from Payao and it is here that most of the development work has been done. Gotas is about thirty-five kilometers from Payao. The completed project will consist of the wharf, coal bunkers and coal handling equipment, twelve kilometers of railroad to Butong with possible branches to other nearby camps, and the complete mine installation.

The coal at Butong is not fully explored. A seam of first grade anthracite coal 8-ft. 4-in. thick has been discovered at a depth of 43 meters. This is reached by means of a small two-compartment shaft and the miners are now sinking a slope near the shaft for permanent haulage. Diamond drills are now at work to determine the extent of this promising deposit. The outcroppings are found on both sides of a slight elevation 4,000 meters across and about 6,000 wide. If the seam is found to be at all uniform there should be in this deposit alone more than 75,000,000 tons of anthracite.

The chief handicap is the lack of miners. There are very few laborers in the Philippines with any mining experience.

The National Coal Company is also developing the coal fields of Cebu. The work consists of the development of a small coal property leased from the Compostela Coal Company. There is a branch of the Philippine Railway, constructed at the expense of the National Coal Company, leading from Compostela into the hills, a distance of seven kilometers. From the railroad an aerial cable way is being constructed into the mine four kilometres further. There is a very good grade of bituminous coal on the Compostela property. The chief difficulty there also is lack of miners The transportation system will be working by June 1.

Mining Prospects in South China.—A report in the Chinese vernacular press states that the mineral industry experienced a great set back in South China on account of the lack of railway communication with the various mines, and numerous pirates spreading all over the country, both of these hinder the transportation of the mineral products into Canton for exportation. With the exception of gold and silver, which are still unexploited, wolfram, lead, antimony, and manganese have been exploited with a slight degree of profit while the European War was waging, as there was then a great demand for these mineral products to supply the manufacturing of the necessary war materials. During the great upheaval in Europe coal miners even made some profit, as there was a shortage of tonnage for conveying Japanese coals here. Until some years ago native coal alone was used as there was then very little importation of foreign coal, and the coal merchants could enjoy a monopoly in the market. Foreign coal is now but lightly taxed at about 42 cents a ton only, whereas native coal has been taxed by the collector of internal revenue to an almost untolerable degree, the internal tax amounting to $3.00 a ton. Besides this is a drawback in transportation, because of the scarcity of railway and the shallowness of the rivers which delayed the transportation and thereby increased the cost of the coal. It takes but four or five days to bring Japanese coal to Canton, while it takes more than ten days to transport coal from the North River districts. Since the end of the European war nearly 90 per cent. of the coal merchants experienced a great loss.

Talc Deposits in South Manchuria.—There are large deposits of high-grade talc near Tashih Chiao, South Manchuria, China. The crude material can be delivered at the dock ready for shipment, in bulk, at about $7.25 per ton, or in strong sacks at about $9 per ton.

Big Copper Mine Closed in Japan.—A report from Yamaguchi, Japan, states that the Yasaka copper mine in Yamaguchi prefecture has stopped working because the revenue does not suffice to cover working expenses. All the miners have been discharged.

FINANCIAL

Loan for Mongolia.—The frontier defence force in Mongolia has arranged for a loan of Y.5,000,000 with the Yokohama Specie bank, to be secured by taxes from Inner Mongolia.

New Industrial Loan Movement in China.—An Industrial Loan movement has been inaugurated by Paul Myron Linebarger in the American Option Company, which has for its purpose the cooperation of Chinese and Americans for the building of industrial plants.

High Dividends Paid by Japanese Companies.—The Rasa Island Phosphate Company and the Meiji Sugar Manufacturing Company have declared dividends of 200 per cent. per annum. The Meiji Sugar Manufacturing Company has also decided to increase its capital from Y.12,000,000 to Y.30,000,000 by issuing fresh shares.

German Indemnity to China.—It is reported that the total amount to be paid by the German Republic to Chinese merchants and others on commercial agreements, contracts and private debts for sustained losses is about twenty-two million dollars.

New Trust Company in Japan.—The International Trust Company, projected by well-known Japanese financiers connected with the 15th Bank, has decided to complete its organization as a working concern. The payment of a quarter of its authorized capital was completed at the end of April.

Chinese Stamp Tax in Foreign Concessions.—The Diplomatic Body at Peking has agreed with the Government of China that the Chinese Stamp Tax shall be enforced on Chinese residents within the limits of the Foreign Concessions in China and a proclamation has been issued by the Chinese authorities setting forth the original steps taken to enforce this law within the Foreign Concessions and giving a schedule of the duties to be collected.

Bank Amalgamation in Manchuria.—The proposed amalgamation of the Sungari Bank, Harbin, with the Lungkou Bank, Dairen (Mr. H. Hiratsuka, Manager), has been granted by the Kwangtung Government.

Industrial Bank for China.—The entire proceeds that are realized from the sale of the Premium Industrial Bonds issued by the Chinese Ministry of Agriculture and Commerce will be handed over to the Bank for Industrial Development as its capital. A sum of three million dollars is expected to be realized from these Bonds after deducting the necessary expenses.

Loan for Chinese Railway.—The Director-General of the Lunghai Railway has been negotiating for a short-term loan in Belgium, and it appears that the general terms of this loan have been arranged as follow :—(1) The total amount of the loan to be Frs. 25,000,000. (2) The security to be the Lunghai Railway. (3) Interest to be eight per cent. per annum. (4) Period of redemption to be 10 years from the date the agreement is signed. For the first five years, only interest is to be paid. From the sixth to the tenth year, one-fifth of the capital to be repaid in each year. The Chinese Government has authorized the sanction of these terms.

Compulsory Insurance on Chinese Railways.—Under the auspices of the Chinese Ministry of Communications, an insurance system is being started for the officers employed on the different Government Railways.

Japan's National and Domestic Loans.—The Japanese Finance Ministry reports that at the end of April Japan's national loans amounted to Y.2,793,562,000, of which domestic loans amounted to Y.1,482,424,000. During the month, no fluctuation occurred in foreign obligations, but Y.680,000 of domestic obligations was repaid while Y.470,000 was increased. Besides, there was the issue of Extraordinary Exchequer Notes up to Y.484,311,000.

The Hukuang Railway Bonds.—It is understood that Mr. Alfred Sze, the Chinese Minister to Great Britain, has telegraphed to the Government, pointing out that China's failure to honour the Hukuang bonds issued to Germans, would destroy the country's prestige in foreign markets and contending that the interests on the coupons should be paid at all costs. It is contended by officials in Peking that the Peking Government should not pay the interest on these bonds and the fact that such German bonds have changed hands since China declared War on Germany is regarded as an attempt to defeat China's claims in connection with the war. China does not wish to repudiate the bonds but simply to withhold the payment of interest on the coupons held by Germans, when China declared war against the Central Powers. China can never admit the transfer of loan bonds in the hands of the Germans to any foreign party.

Mr. Lamont on China's Resources.—Before his departure from China Mr. Lamont made the following statement :—"In response to repeated requests to express some opinion regarding the situation in China, I can only say that my visit here has been of the greatest possible interest to me and I believe has given me a somewhat clearer understanding of China's problems. Moreover my observations here confirm my belief in the great extent of the underlying strength of China's resources, the integrity and industry of her people and the elements which, in spite of temporary difficulties, make for the nation's future stability and strength. I am returning to America, having accomplished the object of my visit to China, which was to obtain for the proposed new Consortium a more adequate view of the Far Eastern situation. It must be appreciated that my brief visit is but the first step which the international banking groups must take in the way of investigation and planning, if they are to render effective assistance to China in the development of certain of her great public enterprises. The situation here is so complex and important that so far as the banking groups are concerned its study and development must be matters not for a day but for a patient future, which I trust may be marked by cordial co-operation between the Chinese people and the great body of investors of the Western world which the banking groups represent."

China's Financial Situation.—The Chinese Ministry of Finance recently prepared a detailed report on the financial situation of the Government. It says that from the 4th to the 7th Years of the Republic the arrears owing to the various Government Departments were $30,000,000; and in the 7th and the 8th Years the debt owed to the military Departments alone was "ordinary," $17,000,000 and "extraordinary" $30,000,000; to the Administrative Department, $15,000,000; and to the Bank of China and the Bank of Communications $50,000,000, exclusive of the foreign and domestic loans concluded from time to time amounting to more than $130,000,000. Thus the total amount of debts is $270,000,000. The monthly receipts of the Central Government is only $6,000,000, while the expenditure exceeds $16,000,000.

Consortium Loan Plans Agreed On.—An understanding having been reached between Great Britain, France, America and Japan, the Consortium was formally organized on May 4. Viscount Uchida, Minister for Foreign Affairs, reported on the subject at a meeting of the Japanese Cabinet.

The Japanese Foreign Office issued the following statement on May 12 on the subject of the Consortium : Japan's attitude toward the Consortium differs from that of the other Powers because her vital national interests are involved. On account of her contiguity to China, Japan must consider the requirements of her national defence and economic existence in connection with enterprises undertaken on her border. After a frank exchange of views with the United States, British and French Governments for a further, more definite understanding, these Governments expressly declared that they did not contemplate activities inimical to Japan's vital interests and that they were ready to give a general assurance that those interests would be sufficiently safeguarded.

Japan, therefore, decided to confirm the Paris agreement with the result that an understanding was reached between the representatives of the Japanese and American banking groups. A similar understanding is expected to be made soon between the Japanese and British and French groups. With regard to the scope of the activities of the new Consortium, it is agreed that it will make loans to China, but only such as are made direct to the Chinese Government or are guaranteed by the Chinese Government and raised by public issue—these being exclusively reserved to the Consortium. Consequently loans to Chinese capitalists or corporations will be left outside the Consortium's scope.

As the new Consortium has now been called into existence, it is confidently hoped that the peoples of China and Japan will lend support to the present international undertaking. The Consortium agreement was signed on May 11 between a representative of the Japanese bankers and Mr. Lamont. Negotiations with the Chinese Government are expected to open after the formal organization of the Consortium. It is believed that the head office of the Consortium will be established in Peking. Mr. Lamont, in the course of a speech at a dinner given in his honour on May 11 at the Tokio Bankers' Club, emphasized that the Consortium was designed, firstly, to assist China in the development of her great necessary public utilities : secondly, in this way to help to create in China more stable economic conditions and thus make this great country a better field both for domestic and foreign trade and more inviting for private initiative, which all wished to encourage : and, thirdly, to bring about closer relationship among the leading nations of the world, working thus in harmony in a common cause—a relationship that ought to be a considerable factor in keeping secure peace in the Far East and perhaps in the whole world.

Philippine Loan for Irrigation Purposes.—The bill providing for the floating of a bond issue for irrigation purposes has been passed by the legislature of the Philippine Islands. The amount of the bond issue will be determined by the congress of the United States, but the insular government hopes that congress will permit an issue of P.60,000,000, to carry out a program extending over ten years, during which time it is proposed to bring 300,000 hectares of land under a permanent system of irrigation. The bonds will bear interest at 3½ per cent. and are exempt from local taxation.

Vanderlip Mission in Japan.—A distinguished mission arrived in Yokohama on April 27 from America on board the N.Y.K. s.s. *Kashima Maru*, headed by Mr. Frank A. Vanderlip, President of the American International Corporation and left on the *Korea Maru* on May 14. The party included such eminent personages as Henry W. Taft, lawyer and brother of ex-President Taft; Dr. Jacob Gould Schurman, former president of Cornell University; Mr. Harry Benedict; Mr. George Eastman, president of the Eastman Kodak Co.; Mr. Lyman Gage, ex Secretary of the Treasury; Mr. Darwin Kingsley, president of tht New York Life Insurance Co.; Mr. Benjamin Strong, banker; Mr. Lewis Clark, banker; Mr. Julian Street, journalist; and Mr. Lyman Bergen Davis, lawyer. The mission has been holding unofficial conferences with prominent Japanese such as Viscount Kaneko, Baron Shibusawa and others on questions concerning American-Japanese relations, and particularly on the immigration question; co-operation of Japan and the United States in the development of China's industry and commerce, and the joint investment of capital in Japan; the Shantung question; Siberia; Korea and the matter of improved submarine cable facilities between Japan and the United States. The proceedings of the conference were wholly unofficial, informal, and confidential. It is reported that the conferences came to a close with an exchange of notes mutually pledging maintenance of the traditional friendship between America and Japan and co-operation for the development of Pacific trade and other activities.

Siam's Currency.—At the end of March the value of the Siam Government Currency Notes in circulation was Ticals 108,596,694, being Ticals 7,251,810 less than at the end of February. Of the total Ticals 8,609,870 was retained in silver at the head office, and the balance was invested. At the end of July last the circulation reached a maximum of Ticals 143,518,071, so that there has now been a reduction of close on Ticals 35 millions, while at the same time there has been a slight increase in the coin reserve. None of the Gold Standard Reserve Fund is now held in sterling.

MISCELLANEOUS

Mongolian Development—Baron Okura's Enterprise.—Baron Okura Kihachiro has made a proposal to form a company, known as the Hsing Fah Company, for the development of waste land in East

Mongolia in conjunction with the Chinese authorities in Fengtien. According to the Memorandum of Association the capital of the company shall be six million yen, to be equally subscribed by the promoters.

The commercial object of the company is that of developing waste land in East Mongolia. A head office shall be established at Mukden with branches to be opened where and when deemed necessary. As regards exclusively the staff of engineers and experts only Japanese shall be employed.

The above regulations shall remain in force for a period of thirty years, during which the company shall abide by all the regulations governing Chinese companies, and it shall also act upon any orders issued by the Government. The above proposal shall only come into force after it has received the approval of the Chinese Government.

Japan's Trade with China.—According to the "Japan Times and Mail" the trade situation between Japan and China has been restored almost to normal although transactions in a few lines are still at a standstill. Despite the gradual increase of exports, the value of trade, both in exports, and in imports, still does not come to the total of former days owing to the advance of silver quotations, according to the Finance Department authorities, who, however, take very optimistic views as to the future.

American Legation Changes.—Peking papers state that Dr. Charles D. Tenney, the Chargé d'Affaires of the American Legation at Peking, will retire from the diplomatic service immediately on the arrival of Mr. Charles R. Crane, the new American Minister. With the departure of Mr. Spencer, the first secretary, who has been appointed to Peru, and the retirement of Dr Tenney, the affairs of the U.S. Legation in Peking will be almost entirely in the hands of a new staff. As a diplomatic officer and as an educationalist, Dr. Tenny has rendered great service to his own Government as well as to the Chinese, and his retirement will be regretted by many.

Strength of British Troops in Far East.—The following is the cost of various troops stationed in Far Eastern garrisons, exclusive of Indian or local troops :—

SINGAPORE AND STRAITS SETTLEMENTS.

1 Battalion of Infantry (933 of all ranks)	£182,525
Royal Garrison Artillery (160 of all ranks)	34,472
Royal Engineers (20 of all ranks) ...	5,007
Other Corps and Departments (36 of all ranks)	20,686
	£242,690

HONGKONG.

1 Battalion of Infantry (933 of all ranks)	£182,496
Royal Garrison Artillery (211 of all ranks)	45,343
Royal Engineers (42 of all ranks) ...	10,517
Other Corps and Departments (141 of all ranks)	35,937
	£274,293

NORTH CHINA.

Corps and Departments (37 of all ranks)	£8,723

Details of Colonial troops and Indian troops in the various garrisons are omitted, although approximately known. The above figures are supposed to represent the strength of the British troops on April 1, 1920, and the amount of money taken for them.

Japanese to Organize Mongolian and Manchurian Civilization Association.—Japanese colonists in Manchuria are promoting the organization of a society to be called the Mongolia and Manchuria Civilization Association, the aim of which is stated to be scientific research work in China's northeastern and northwestern territories. The Chinese, however, suspect that the real aims of this association are of a more material character, and the Chinese press calls attention to the fact that the Japanese are devoting much time and money to the exploration of Manchuria and, more especially, Eastern Inner Mongolia. Japanese investigators are to be found everywhere in these territories, learning their language and tabulating their resources, while the Chinese are for the most part entirely ignorant of conditions in their Manchurian and Mongolian territories.

The Rome-Tokyo Flight.—The Italian aviators, Lieutenants Ferarin and Masiero, had reached Seoul, Korea, on their way to Tokyo, when this issue of The FAR EASTERN REVIEW was going to press. At Shanghai, Peking and other points in North China, the famous birdmen, first to fly to the Far East from Rome, were given an enthusiastic reception. Lieutenant Ferarin reached Shanghai on May 2, coming direct from Foochow. On May 9 he took the air for Tsingtau, landed safely in the former German concession and, after a week's rest and entertainment, continued the journey to Peking. His descent at the capital on May 17 was witnessed by huge crowds and a suitable welcome was tendered to him by leading Chinese and foreigners. On the following day, Lieutenant Masiero joined his compatriot at Peking. Ferarin left the capital on May 23 and Masiero on May 24. The aviation department officials presented the birdmen with silver cups in appreciation of their courage and enterprise.

COMMERCIAL

Some Facts About Chinese Trade.—Chinese imports from Japan increased 714 per cent. between 1904-1919, from the United States 244 per cent., and from England 49 per cent., according to a commercial handbook on China issued by the Bureau of Foreign and Domestic Commerce Department of Commerce, at Washington. In Shantung the trade of Tsingtao has nearly doubled since the Japanese occupied the port. The Japanese administration at Dairen, in Manchuria, has been active in trade promotion, and the commerce there has increased, in eleven years, from $22,000,000 to $198,000,000. The United States has made substantial progress in selling merchandise to China, shipping $117,000,000 worth in the fiscal year 1919 as against $57,000,000 in 1914, just before the beginning of the war. In one notable item, however, a great decrease has occurred; American sales of cotton goods to China have fallen off from nearly $30,000,000 in 1906 to $1,200,000 in 1918. China's foreign trade is five times as great to-day as it was thirty years ago. When the *per capita* foreign trade is equivalent to that of Australasia, the total will be $65,000,000,000 instead of the present $1,200,000,000; it is believed that this figure may eventually be attained because of the country's vast wealth in coal and basic metals, in vegetable, animal products, and the industrious, adaptable character of its population. Taking the single item of coal, it appears that China has enough to supply the world with a billion tons a year for a period of a thousand years. Hundreds of millions of tons of iron ore are available. All the prerequisites of industrial development are present, and even now cotton-mills in Shanghai, Hankow and Tientsin are paying dividends as high as 25 per cent.

Kiakhta a Famous Siberian Tea Depot.—Recent railroad building activities in Siberia have brought the name of the famous old town of Kiakhta into the limelight as a possible important depôt for receiving tea from Hankow in China for the tea drinkers of Moscow. In the days when camel caravans traveled the trial through Kiakhta, this town was the most important way station on the route. In fact the tea trade brought the town into existence. The building of the Trans-Siberian railroad to Vladivostok forced the caravans out of business, and Kiakhta lost its prestige.

Now that a railroad is being built along the ancient camel trail Kiakhta is expected soon to resume its old position as the most important tea depôt between Hankow and Moscow. The town has a promising future, according to a bulletin issued by the National Geographic Society. One rail head has been pushed south from the Siberian border and another line connects Peking to Kalgan, so that there remains only a thousand miles of easy railway building to shorten the tea route from Hankow to the Trans-Siberian at Vehrne-Udinsk by one-half and to obviate entirely the need for transporting across salt water the tea to which Kiakhta owes its very being. Just across the boundary line, only a stone's throw away, is the Chinese companion city, Miamachen. Kiakhta and Maimachen face each other across neutral zone only a few feet wide, but they are as different as two such Siamese twins among border cities can well be. Miamachen is Chinese, bare and gray, filled with Oriental figures in the blue gowns of China. Kiakhta is Russian, with churches and great white houses, and its inhabitants wear the familiar blouse and boots of the Russian from Dnieper to the Amur. The twin cities form a station in the long route between the tea-packing establishments of Hankow and the fair at Nijni Novgorod. With the completion of the Trans-Siberian it became a very simple thing to load tea ships at Hankow, in the heart of China, and unload them at Vladivostok, when a direct railway led to the heart of Russia. Then the caravan tea trade, which had reached 50,000,000 pounds a year, began to decline. The long camel trains across the Gobi desert through Yurga, where dwells the Chief Lama of the Mongols, became fewer. The desert journey of a thousand miles, which plodding camels finished in forty days, was supplanted by a water and rail route much longer in distance but shorter in time. Steamers and boxcars formed the last straw which broke the camel's back as a tea carrier. But the tea tasters at the Nijni fair, on the Volga, declared that they could detect the deterioration in quality due to transport over a water route and the connoisseurs of Russia have secured a considerable amount of Hankow tea, much of it compressed into brick form, over the Gobi route. Until the iron horse takes the place of camel caravan or oxcart, there will probably be plenty for the Mongol and Buriat camel drivers to do along the great tea trail. Recently there have been about 100,000 camels used in tea transit alone, but with the breakdown of the Trans-Siberian caravans have been changed from anachronism to necessity, and between one and two million camels are being used in Mongolia, Trans-Baikalia and Manchuria.